

AGRICULTURAL PROBLEMS OF INDIA

DR. C. B. MAMORIA

Faculty of Commerce,
School of Basic
Sciences & Humanities
University of Udaipur
Udaipur

KITAB MAHAL

First Edition, 1953
Eleventh Edition. 1984

Selling Agents :

1. Kitab Mahal Agencies,
84, K. P. Kakkar Road,
Allahabad. Phone—50540
2. Kitab Mahal, Distributors,
28, Netaji Subhash Marg,
New Delhi. Phone—273230
3. Kitab Mahal, Agencies,
Ashok Raj Path, Patna. Phone—50599
4. Kitab Mahal, Agencies,
Manoj Building,
Central Bazar Road,
Ramdas Peth, Nagpur.

Price Rs: 55.00

*This book has been printed on the paper supplied through
the Government of India at Concessional rate.*

Published by : Kitab Mahal, 15, Thornhill Road, Allahabad

Printed by : Kitab Mahal (W. D.) Pvt. Ltd., Allahabad.

FOREWORD

Prof C.B. Mamoria has rendered a great service to all those who are interested in Rural Economics by writing this comprehensive and unbiased thesis. He has brought together, in this scholarly survey, almost all the available information that can be culled from government reports, book and bulletins, etc. published in England and available in the college and university libraries and presented it in such an able and analytical manner that university students and scholars and those who are now engaged in the community and Rural Development work will find in it an extremely helpful and dependable reference book.

Anyone who wants to understand the implications and significance of most of the recommendations of the different Plans and the Justification for the programme of the C.D.P. cannot do better than carefully study this book.

The study of "Rural Economics" is daily becoming more and more technical and specialised and it is getting intermingled with the latest techniques of the science of statistics. Hence, our efforts to organise agricultural statistics and to found the Indian Society of Agricultural statistics. This book will prove to be good preparation for those students who wish to progress towards the study of agricultural statistics. The sciences of agriculture, forestry, fisheries, cattle-breeding and farming are rapidly getting differentiated from each other and highly developed and it is the duty of agriculturists to absorb and utilise their latest teachings and results in their daily activities in practical agriculture. This thesis indicates the possibilities and the lines on which such a marriage can and ought to be brought about between them and practical processes of work in Indian farming.

The practical economics of the production of foodgrains, has received ample consideration from the author. Such endemic disabilities as rural indebtedness and eternal problem of inadequate and costly agricultural marketing and the too heavy and growing burden of taxation, the unrestricted, uncontrolled and unforeseeable vicissitudes of seasons, incidence of pests, cattle-epidemics have been pictured in detail, with all their historical background. The post-Independence efforts made by Governments to tinker with or tackle them are reviewed patiently.

The revolutionary removal of the blight of zamindari system which had condemned more than hundred million peasants to uncertain tenancy and unbearable rents and other exactions during the past many centuries is pictured in detail. The latest efforts that so many of our State Governments are making to protect the tenants of the peasant proprietors ; the older section of the newly liberated zamindari areas are also indicated scrupulously.

Agricultural organisation had hitherto been based on the three rocks of absentee landlords (zamindars, talukdars, malguzars, etc.), the cultivating peasants (either peasant proprietors or zamindari tenants) and agricultural workers. The traditional absentee zamindars have been removed since 1947. So we are left with the cultivating peasants (whether proprietors or tenants of some proprietors) and agricultural workers. Certain social and economic problems arise in their mutual relations and their study is dependent upon contemporary developments and this thesis also makes a proper reference to this new phenomenon.

Moneylenders, marchants, processors and transport-organisers provide (What I have called in my "Credo of World Peasantry") the "Key Services" and and they exact too high a price for their ministrations. This thesis follows the orthodox line of study, and gives details of their deperedations at the inadequate steps so far taken by Government to protect peasants from the exactions. The co-operative movement has begun to wrest a small portion of the processing industry from private enterprise.

Anyone who carefully studies this thesis will gain a scientific and valuable panoramic view of the whole of our rural economy to enable him to approach the contemporary problems with which our peasantry will have to come to grips during the next twenty or more years. There is the controversy as to the scale of cultivation, in relation, to the daily developing technology. The Chinese have decided to utilise almost all the scientific advances through the media of collective and co-operative farms but without mechanisation owing to the scarcity of capital and abundant agrarian population and the absence of non-agricultural work for surplus agricultural labour. India is experimenting with heavy agricultural machines, mostly on the hitherto uncultivated lands granted to the displaced persons or Agricultural labour or on the huge estate of a few big landlords. So many wishfully think that if only cooperative or collective farms could be organised, and necessary capital and "knowhow" and tractor-drivers, etc. could be obtained, India could be benefited, and agricultural production stepped up through the economies of scale. They ignore the significance of absence of alternative employment for those who would be displaced by such mechanisation, the great competitive demand for national capital and "technical know-how," made by other sectors and the possibilities available for peasants to derive most of the economics of scale and partial and phased mechanisation through the development of service co-operatives as and when the State is in a position to finance and support such co-operatives.

There is now a nation-wide controversy as to the advisability of assuming that small-holdings are necessarily uneconomical. Is the economy of small-holdings to be Justified from the point of view of the peasants themselves or from that of productivity of land? Which is more important to the nation; the production per peasant or the production per acre? Is a holding more intensively cultivated by a small peasant or by a large-sized co-operative or collective? What is more in the national interest that every peasant should have some land however small, enjoy some days of free, independent non-exploitative, soul-satisfying labour, as self-employment on his holding, whether owned or rented or that crores of wholly unemployed people should stalk the land, once collectives, co-operatives come to be organised, with or without full mechanisation or that even larger numbers of peasants should become wage-earners in co-operatives, albeit under the leadership of their technically chosen executives but under the orders of the salaried employees of the co-operative farms? Even Communist countries are obliged to recognise the value of free peasantry. We put a premium on free, independent, self-employed, small-holders.

There is another equally important controversy agitating the mind of our nation. Is the peasant economy to be accepted as one of the progressive, socialist forces, conducive to decentralised, productive and free society and therefore deserving of all support from the state and society or is it to be replaced by co-operative or collective farms and all the peasant masses to be converted into the member-employees of the co-operative farms or mere employees of the collectives, and placed in either case under the control, direction and supervision of the salaried officials and mistris of the management? Is peasant proprietorship to be considered anti-social institution or is to be accepted as a functional and creative source of progressive incentives for greather exertion and production initiative and enterprise? Are not the non-

exploitative self-employment characteristics of peasant proprietorship worthy of a truly socialist and free society ?

There is a third controversy over an allied subject. Is the modern progressive and socialist society to work towards and welcome the development of the self-employed status for as many people as possible or is it to oppose, undermine or ignore the value of such a status and turn all individuals into salaried employees or wage earners, under the employ of a collective or co-operative farm or state-managed enterprise ? Is it not the primary objective of socialism to help as many persons as possible to liberate themselves from employment under another set of people, whether they be their own elected chiefs or corporations established by Government ? When more than two hundred millions of peasants or fifty million peasant families are today self-employed, thanks to their work on their small-holdings or more than fifty percent of total population of India, will have to be dependent upon agriculture even by 1981, will it be a progressive or socialist tendency to deprive them of their social freedom and their self-employment status even there are no other alternative employments with only wages or salaries, in any other walk of life ?

This thesis has ably portrayed the history, ideals and present state of the co-operative movement in India. It has also given a brief account of the suggestions made by the Rural Credit Survey of the Reserve Bank of India, the action taken thereon by Government and credit advanced by the Reserve Bank in pursuance of those recommendations. All are agreed that the future protection and progress of our peasantry can be best furthered by the all-round, rapid and masswise development of co-operative effort by peasants.

Co-operative Farming has not proved to be a success in India, nor has it been an unqualified success in any of the communist countries. In fact more than 50% of co-operative farms have come to be disbanded in Poland and Yugoslavia. The economies of scale associated with large scale farming need not be achieved only through cooperative farming. The experience of Japan, Denmark, Sweden, Switzerland, Ireland and United States has proved that through Service Co-operatives, almost all the economies of scale can be achieved by small peasants working separately on their own small holdings. It has also proved that service co-operatives can protect peasants from the exploitation of key services. To protect, strengthen and encourage peasants by clothing them with service cooperatives and insuring them in other ways from the vicissitudes of seasons and economic blizzards and yet organising co-operative farms on all the Government lands and other lands which would be obtained on the operation of the ceilings on land holdings and also through Bhoodan and thus enable these two processes of land use and peasant way of life to co-exist and compete in a wholesome manner and to influence and benefit each other or to dismiss the well tried and resilient peasant economy as of no more use and embrace the untried and unproved co-operative farming as the panacea for rural progress ?

Shri Mamoria has indicated some of the urgent steps to be taken by Governments, Co-operatives N.E.S. and Social workers to improve the social and economic conditions of our agricultural workers. He could not go into great details about the prospects for alternative employments ; since even the Planning Commission is unable to hold out any hopes of eliminating their under-employment within the foreseeable future. It is admitted by all that the burden of population on land, which is another expression for the absence of alternative employments, is bound to be too heavy right up to 1981. Therefore, will it not be the duty of repiadly developing industrial and commercial sectors of our national economy to agree to make adequate contribution to agricultural sector or from out of their shares of national income and wealth, so as to make it possible for agricultural workers to earn higher wages, peasants to gain higher

incomes, the better to enable them to maintain their unemployed and under-employed dependents on at least subsistence level and thus relieve our rural economy from its present courses of undernourishment and all its social consequences ?

Sri Mamoria has given ample details about the abortive efforts so far made to protect peasants from the vagaries of world markets and to assure them of a minimum level of prices. The rationale for stabilising agricultural prices to be on a par with industrial prices and for evaluating the professional and at least proletariat was worked out in my book 'Credo of the World Peasantry'.

Yet another controversy has arisen over the question of ceilings. This thesis rightly favours the idea of fixing ceiling upon land holdings. But at what level should it be fixed ? Is it to be fixed at three times as much as the basic holdings, (as indicated by the Draft Second Plan) or five to ten times (as suggested in my minority report to the Agrarian Reforms Committee) or up to six times (as indicated by the final Second Plan) or at what level ? And is the ceiling to be fixed on present holdings or only to prevent further acquisition of land ? These and many such questions arise, as the pressure of demands made by industrial development, upon the surplus wealth produced by agriculture grows ; for, after all the growth of non-agricultural development and wealth is so largely conditioned by the rate of growth of such surplus wealth that Government can extract from agriculture and peasants.

Prof Mamoria has made a detailed study of land revenue systems, the incidence of land revenue and concluded that their burden has been growing disproportionately. Recently the burden of central excises, sales taxes and stamp duties has become too oppressive. The Mathai Commission's recommendations and the planmindedness of Parliament have provided justification for such growing burdens upon peasants. Our National Planners, Parliament and Governments have to make up their minds as to the fundamental issue, whether they want peasant economy to progress and prosper and the country to be profited through it or whether they are determined to prove such a policy through their various programmes of taxation, public expenditure, controls as to make it unprofitable and unhappy for peasants to own, and cultivate their holdings and continue to function as independent, free and selfreliant and self-respecting entrepreneurs, producers and toilers on the land ?

On what do the answers to these questions, controversies and campaigns depend ? Not merely on the sweet will of those in power on the prejudices and predilections of the urban-minded officials or consumers, although they are always bound to have a great say in these matters, but also, on, the nature and degree and temper of the peasant masses and much more so, on the effectiveness of their organisation ? Prof. Mamoria has provided a good study of the ravages caused by famines, droughts, floods, cyclones, frost and other vicissitude of seasons and also by wasting erosion of the soil, pests and wild animals.

What have the Government done to provide the minimum of socio-economic infra-structure by way of rural communications, ware-houses, organisation of chain of regulated markets, cheap and plentiful credit, rural water supply, compulsory elementary education, adult education in farming, fruit preservation facilities, etc. in order to enable our peasants to achieve greater efficiency, larger production, minimisation of wastage of farm-products and achievement of higher degree of proficiency in their profession ? Is it enough to point at the community development works when they are still in their initial stages ? Is not the provision of elementary education for all the rural people the first function of our Government ?

The readers of this thesis have to supplement their knowledge by reading the literature produced by those of us who have been building up and working

in peasant movement. That literature has of course remained beyond the ken of orthodox economists and university circles, who have somehow felt that they should not be singled by semi-political controversies. Centuries-old zamindari system which held more than half of India in its iron grip came to be revolutionary-mindedness of party in power in post-Independence era, but especially because of the thirty-year long nation-wide peasant movement against that system through the leadership of the All-India Kisan Congress, its thesis "Economic Conditions of Zamindari Ryots" its slogan "Down with Zamindari Systems" and its tremendous peasant marches in which lakhs of peasants took part. Sri Mamoria has given a full account of legislation licensing money-lenders, Debt Relief Acts passed by the Assemblies in 1936-39 and again since 1957. He has also indicated the nature and extent of the revolutionary move of declaring moratorium for agricultural debts. All that legislation was only the visible and legislative result of the great peasant movement carried on since 1931, demanding moratorium, scaling down of debts of peasants and cancellation of inherited debts of Agricultural workers.

It is not so much for our Universities and N.P.C. to say if we are to go the Socialist or Capitalist or Co-operative or Gandhian way, to achieve progressive, prosperous and happy peasantry and dynamic and productive agriculture. It is for the peasantry to decide whether they will allow their fate and future status and freedom to be decided either by the Governments or theoreticians of the non-agricultural interests. Therefore, these peasants, intellectuals hailing from rural areas and champions of democratic socialism will benefit much by making this authoritative thesis of Prof. Mamoria their groundwork and source book.

I heartily congratulate Prof. Mamoria on his monumental thesis and thank him for the great industry and scholarship he has devoted to the study of problems of peasantry and enrich their understanding of rural economics. The protagonists, followers and leaders of the peasant movement, the bureaucracy, the persons in charge of running agricultural, Cooperative and Rural development departments, the laymen and the student community have all much to learn from this thesis because it is about the best and most comprehensive survey of the theories so far prevalent in university and governmental circles, summary of the available official reports of Commissions and Committees and relevant historical material.

Prof. N. G. Ranga

New Delhi

PREFACE TO ELEVENTH EDITION

The rapidly increasing popularity of the book has encouraged me to bring out this thoroughly revised, updated and enlarged edition, with a number of changes in the original chapters. Most of the chapters have been completely rewritten giving latest developments in the field. In others, much new material has been added, such as, portions on Drought Fighting Programmes; National Water Grid and the Garland Canal; Operation Flood Projects; Special Programmes for Agricultural Labour; New Agricultural Credit Policy for weaker sections; Rural Banks; IADP and IAAP Programmes; Rural Development Programmes; Antyodaya Movement and Minimum Needs Programmes; Panchayati Raj Committee's recommendations; and Rural Employment Schemes, etc. With the addition of latest available information and data it is believed that the present edition will prove useful for all those who are concerned with knowing about the various of our premier national industry.

I am thankful to numerous friends and colleagues in the profession who have given me the benefit of their experience in the field by offering many useful suggestions, and novel ideas, many of which have been incorporated in this edition. Suggestions for further improvement are welcome.

I owe a deep debt of gratitude to Shri I.K. Agarwal for his taking personal interest in the early printing and release of the book in its present form.

My sons Shri Harish Mamoria and Dr. Satish Mamoria also deserve my thanks for sparing me from many onerous household duties and devoting myself to the completion of this work early.

C. B. Mamoria

PREFACE TO THE SECOND EDITION

Since the publication of the first edition of the book vast changes have taken place in the agricultural and non-agricultural sectors in the country, due to various schemes that had been launched and completed under the Five Year Plan. In the First Plan emphasis was placed on agricultural expansion with a view to provide food and raw materials for the country needed to keep its population above subsistence level and its industries on a sound footing. In the scheme of agricultural productivity programmes, as envisaged in the Plan, had been included projects of three main types. The first centred round Land Reforms, Major Valley Projects and the Reclamation of Waste Lands in the country. The emphasis had been on the adjustment of land use capacity for improved farm techniques. The programmes at the village level were complementary to the first type and were focussed on Community Projects, development of National Extension Service, Rural Reconstruction, expansion of Research and its application to the field. This third type of schemes constituted a link between the two and aimed at balanced economic development of the country.

The validity as well as the possibilities of achievements envisaged under the Plans are subject to the serious limitation of the lack of precise knowledge and comprehension of the various factors that offers strong resistance to development in agricultural and in the rural sector of economy.

The situation, therefore, clearly emphasises the need for a careful review and the searching analysis of the basic problems and policies in agriculture in their entirety. The object of the revised thesis has been to throw light on the nature of the varied problems facing our agricultural industry, together with the developments that have taken place in the country during the last half a decade as a result of the implementation of various measures under the First and Second Plans.

In bringing out this edition every care has been taken to delete out-of-date and irrelevant matter, make necessary amendments in the light of the progress achieved during the First Plan, and make the thesis very comprehensive and reliable. For this purpose majority of the chapters have been rewritten. The arrangement of the chapters has also been reshuffled and the whole compendium has been divided into three sections, the first one dealing with Agricultural Production, the second one with Rural Finance, Co-operation and Marketing and the third one with Land Reforms and Policies. Statistical data have been brought up-to-date with the help of the Statistical tables kindly supplied by Dr. S. R. Sen, Economic Adviser to the Ministry of Food and Agriculture, Government of India, and Dr. R. N. Poduval, Director and Deputy Economic and Statistical Adviser, Ministry of Food and Agriculture, for which both of them deserve my sincerest thanks. Government publications have also been freely made use of, along with the other material that has appeared in print for the last few years. With all these additions and alterations, it is earnestly hoped that this edition like its predecessor, will meet the genuine needs of the Advanced students of M. A. (Economics and Geography); M. Com. and M. Sc. (Agriculture) and Competitive examinations for their Rural Economics Papers.

My sincere and heart-felt thanks are due to Prof. N. G. Ranga, for writing an illuminating and thought-provoking Foreword to this thesis in spite of his very busy time at the parliamentary session. My publishers are also to be thanked for bringing out the book in such a nice print and get-up. I am also thankful to Sri R. K. Rawat for preparing the Bibliography.

Any suggestions for the further betterment of this book are cordially invited from the colleagues and learned authorities on the subject.

C. B. Mamoria

**Janki Villa,
199, Bhupalpura,
Udaipur**

CONTENTS

1. NATURAL ENVIRONMENT 1—22

Geographical Situation, 1. Physical features, 2. Climate, 5. Climatic Regions, 10. Effects of climate on Agricultural Economy, 13. Agricultural Regions, 13. Types of soils, 17.

2. PROBLEM OF SOIL EROSION 23—45

Agents of erosion, 23. Types of soil erosion, 24. Causes of soil erosion, 25. Magnitude of soil erosion problem, 29. Effects of soil erosion, 35. Conservation of soil, 36. Conclusion, 45.

3. DROUGHT AND FLOOD PRONE AREA PROGRAMMES 46—58

Drought areas, 46. Drought fighting programmes, 47. Drought Prone Area Programme, 50. Floods, 51. National Flood Control Policy, 55. Progress of flood control work, 55. Forecasting of floods, 57. Flood control bodies, 58.

4. FOREST RESOURCES AND FORESTRY DEVELOPMENT 59—92

Forests in historical past, 59. Destruction of forests, 60. Types of nature vegetation, 62. Classification of forests, 65. Regional distribution of forests, 65. Importance of forests in national economy, 67. Low productivity of forests and its causes, 72. National forest policy, 75. Forest development programmes, 78. Social forestry, 84. Conclusion, 87. Appendix, 88.

5. UTILIZATION OF LAND AND CROPPING PATTERN 93—117

Land resources, 93. Classification of land, 94. Areas difficult for cultivation, 102. Possibilities of extension of cultivated area, 103. Land reclamation schemes, 105. Optimal land-use pattern, 106. Cropping pattern, 107. Cropping pattern in India, 110.

6. AGRICULTURE PRODUCTIVITY TRENDS 118—146

Occupational structure of the people, 118. Preponderance of rural population, 119. Importance of agriculture in national economy, 121. Agricultural production and productivity trends prior to Independence, 124. Post-Independence period, 125. Problems of low yields, 126. Consequences of low yield, 129. Causes of low productivity, 131. Re-organisation of agricultural conditions, 137. Possibility of increase in agricultural production, 139. What requires to be done? 142. Conclusions, 143. Appendix, 145.

7. AGRICULTURAL HOLDINGS IN INDIA 147—172

Meaning, 147. Size of holdings, 147. Size pattern of holdings in India, 150. Fragmentation of holdings, 154. Disadvantages of subdivision and fragmentation, 160. Advantages, 163. Causes, 163. Remedies, 165. Consolidation, 165. Co-operative village management, 169. Restriction on further sub-division, 170. Appendix, 171.

8. AGRICULTURAL INPUTS AND TECHNOLOGY**173—220**

Irrigation, 173. Need, 174. Role, 179. Benefits, 180. Demerits, 181. Development of irrigation, 183. Water resource potential, 185. Progress of irrigation, 189. Sources of irrigation, 195. Major and medium irrigation works, 197. Minor Irrigation works, 198. Financing of Irrigation Projects, 200. Water Rates, 203. Modernising Irrigation, 206. Causes of inadequate utilization of irrigation potential, 211. Measures for increasing potentials, 212. Future prospects, 214. National Water Grid, 215. The Garland Canal, 217. Future Irrigation Policy, 218. Appendix, 219.

9. WATER POWER & RURAL ELECTRIFICATION**221—234**

Water power potential, 221. Growth of hydro-power, 222. Areal development of hydro-power, 226. Pattern of electricity consumption, 227. Rural Electrification, 229. Appendix, 234.

10. MANURES & FERTILIZERS**235—264**

Soil and losses and nutrients, 235. Evidence of Soil exhaustion. 237. Consumption of Manures and fertilizers, 239. Manurial requirements, 240. Nature and functions of manures, 241. Farmyard measures, 242. Village and Town refuse compost, 244. Agricultural and animal wastes, 247. Human waste, 249. Other wastes, 250. Green manuring, 251. Rotation of Crops, 255. Mixed cropping, 256. Chemical fertilizers, 258. Conclusion, 263. Appendix, 263.

11. IMPROVED SEEDS & PLANT PROTECTION MEASURES 265—286

Improved seeds, 265. Importance, 265. Varieties, 265. Genetic improvement of crops, 270. National Seed Corporation, 272. Plant Protection Measures, 273. Crop Insurance 277. Crop Insurance in India, 281. Appendix, 285.

12. AGRICULTURAL IMPLEMENTS, MECHANISATION & RECLAMATION SCHEMES**287—317**

Traditional Implements, 287. Need for improved implements, 287. Progress in use of improved implements, 289. Mechanisation of Agriculture, 290. Benefits, 293. Scope of mechanisation in India, 300, Progress of mechanisation, 301. Causes for slow progress, 304. Land Reclamation Schemes, 308.

13. ANIMAL HUSBANDRY, DAIRYING AND FISHERIES**318—366**

Magnitude of cattle population, 318. Importance of cattle, 321. Cattle breeds, 324. Present position of cattle in India, 327. Lines of improvement, 331. Intensive Cattle Development Project, 336. Poultry development, 338. Piggery development, 341. Sheep development programmes, 342. Dairy industry, 345. Problems of dairy industry, 349. Operation of Food Project, 351. Cattle Insurance, 354. Fisheries, 355. Areas, 355. Sources, 357. Varieties, 359. Fisheries Development Programmes, 391. Appendix, 363.

14. AGRICULTURAL LABOUR**367—400**

Growth of agricultural labour, 367. Definition of agricultural labour, 370. Agricultural serfs, 372. Rural labour market, 374. Supply of agricultural labour, 375. Unemployment and underemployment, 376. Income and wages, 377. State Policy towards agricultural labour, 383. Abolition of bonded labour, 384. Special programmes for agricultural labourers, 385. Abolition of Bonded Labour, 393. Suggestions for improvement of landless labour, 394. Appendix, 396.

15. RURAL CREDIT & RURAL INDEBTEDNESS 401—432

Characteristics of agriculture and industry, 401. Need for credit in agriculture, 403. Classification of agricultural credit, 406. Credit requirements, 410. Agencies supplying agricultural credit, 411. Rural Indebtedness, 412. Sources of Rural Debt, 419. Causes of Indebtedness, 421. Evils of Indebtedness, 426. Role of State in Relation to Debt Relief Measures, 427. Conclusion, 432.

16. AGENCIES SUPPLYING RURAL CREDIT 433—494

Rural moneylenders, 433. Institutional financing, 437. Co-operative Credit Societies, 438. Land Development Bank, 442. Government and Rural Credit, 442. Commercial Banks, 447. State Bank of India and Rural Credit, 452. Reserve Bank of India, 456. Agricultural Refinance and Development Corporation, 473. Regional Rural Banks, 481. Crop Loan Schemes, 484. Rural Electrification Corporation, 493.

17. PRIMARY CO-OPERATIVE CREDIT SOCIETIES 495—524

Three-tier Structure, 495. Primary Agricultural Credit Societies, 496. Functions, 497. Management aspects, 499. Membership, 500. Liability, 500. Capital, 502. Loans and Loaning Policy, 509. Non-credit operations, 513. Problems of primary agricultural credit co-operatives, 515. Suggestions for Improvement, 516. Grain Banks, 518. Appendix, 519.

18. OTHER CO-OPERATIVE CREDIT INSTITUTIONS 525—552

Central Co-operative Banks, 525. Functions, 525. Membership, 526. Finance, 526. Loaning Policy, 527. Management, 528. Growth and development, 528. Weaknesses, 531. Suggestions for Improvement in working, 553. Apex/State Co-operative Banks, 534. Functions, 534. Membership, 536. Management, 536. Finance, 537. Loaning Policy, 537. Evaluation of the working, 539. Suggestions for Improvement, 540. Land Development Banks, 541. Need, 541. Organisational Structure, 541. Functions, 542. Management, 543. Finance, 543. Loaning Policy, 544. Growth and development, 546. Evaluation of the working, 547. Suggestions for Improvement, 550.

19. MULTI-PURPOSE AND SERVICE CO-OPERATIVES 553—560

Multi-purpose Societies, 553. Necessity, 553. Functions, 553. Membership, 554. Merits and Demerits, 554. Growth and development, 555. Evaluation of the working and problems, 555. Large-sized societies, 556. Service Co-operatives, 557. Functions, 557. Organisation and management, 558. Origin and Growth, 559. Evaluation and problems, 559. Suggestions for Improvement, 550.

20. HISTORY AND GROWTH OF CO-OPERATIVE MOVEMENT 561—598

Traditional forms of co-operation, 561. Growth of the modern movement, 563. History of the movement, 565. Co-operation during the Plan period, 578.

21. EVALUATION OF AND THE GOVERNMENT AID TO CO-OPERATIVES 599—628

General progress, 599. Achievement of the movement, 600. Negative side of the movement, 602. Weakness of the movement, 604. Future of the Co-operative movement, 612. Condition needed for success, 614. Measures for future development, 615. Co-operative aid to co-operation, 618. Forms of State assistance, 620. Concluding observations, 628.

22. STATE AND AGRICULTURAL POLICY**629—648**

Historical Review of the Agricultural policy, 628. Royal Commission on Agriculture, 631. Government of India Act, 633. Russel and Wright's Enquiry, 633. Second World War and after, 634. Independence and after, 635. Ford Foundation's Team, 635. National Commission on Labour, 637. Ministry of Agriculture and Research, 638. Agricultural Education and Research, 640. Agricultural Extension Work, 646.

23. AGRICULTURE THROUGH THE PLANS**649—675**

Agricultural situation on the eve of Independence, 649. Agriculture in the First Plan, 649. In the Second Plan, 653. In the Third Plan, 656. Annual Plan and agriculture, 660. In the Fourth Plan, 661. In the Fifth Plan, 666. Difficulties in agricultural planning, 669. Agriculture Planning under Five Year Plan, 672.

24. NEW AGRICULTURAL STRATEGY OR GREEN REVOLUTION**676—693**

Genesis of new strategy, 676. Intensive Agricultural District Programme, 678. Intensive Agricultural Area Programme, 680. The High yielding programme, 681. Multiple cropping programme, 683. Integrated Development of Dry Areas, 685. Plant Protection Measures, 687. Increased use of fertilizers, 687. New Irrigation concept, 688. Ayacut Development and Water Management, 689. Evaluation of new agricultural strategy, 689. Making of green Revolution successful, 691. Appendix, 692.

25. THE FOOD PROBLEM**694—736**

Historical Evolution of food problem, 694. Food deficit areas, 699. Causes of food shortage, 700. Nature of the food problem, 704. Chief features of Indian diets, 706. Food requirements, 710. Food Policy of the Government, 711. Food Corporation of India, 714. Procurement, 716. Support, procurement and issue prices, 718. Distribution of foodgrains, 721. Statutory Rationing, 721. Other measures, 723. Evaluation of the government food policy, 724. Remedial measures to meet food shortage, 726. Other measures, 729.

26. AGRICULTURAL MARKETING**737—779**

Nature and type of agricultural markets, 737. Special features of agricultural products, 739. Processing of agricultural produce, 739. Methods of sale, 740. System of marketing, 742. Marketable surplus, 742. Marketing agencies, 745. Marketing Finance, 746. Marketing channels for foodgrains, 747. For Rice, 747. Marketing produce, 748. Market conduct, 749. Marketing Facilities, 749. Defects of agricultural marketing, 749. Lines of development, 767. Government and agricultural marketing, 775.

27. CO-OPERATIVE PROCESSING AND CO-OPERATIVE MARKETING**788—795**

Importance and functions, 780. Pattern of organisation and management, 781. Business practices, 781. Growth and development of processing co-operatives, 781. Present position, 782. Difficulties and problems of processing co-operatives, 784. Suggestions for improvement, 785. Co-operative Marketing, 785. Objectives, 785. Co-operative marketing structure, 786. Functions and progress of marketing co-operatives, 788. Co-operative marketing under Plans, 792. Evaluation of the working of co-operative marketing societies, 793. Suggestions for Improvement 795.

28. AGRICULTURAL PRICE STRUCTURE**796—819**

Fluctuation in agricultural prices, 796. Price stabilization, 797. Need for stabilization of agricultural prices, 798. Objectives of price policy, 801. Trends in agricultural prices, 803. Agricultural Prices Commission, 806. Foodgrains Enquiry Committee's observation on Prices, 809. State trading in foodgrains, 810. Criteria for price policy, 811. National Commission on Agricultural Price Policy, 813. Appendix, 1 & 2, 819.

29. RURAL DEVELOPMENT PROGRAMMES**820—845**

General Characteristics of rural people, 821. Recent changes in rural India, 822. Aims and aspects of rural reconstruction work, 823. Pre-Independent Early attempts at rural reconstruction, 823-833. Siriniketan experiment, 823. Martandam project, 824. The Gurgaon experiment, 826. Rural reconstruction movement in Baroda, 828. Sarvodaya scheme of Bombay, 830. Firke development scheme of Madras, 831. Evaluation of early attempts, 832. Post-Independence Scheme of Rural Reconstruction, 833-844. The pilot development project. Etawah, 833. The Nilokheri experiment, 837. Small farmers development agency: marginal farmers and agricultural labourers projects, 839. Hill area development projects, 839. Whole village development programme, 840. Integrated Rural development programme, 841. Criteria for success of rural development programme, 844.

30. COMMUNITY DEVELOPMENT PROGRAMME**846—887**

Evolution of C. D. Programme, 846. Concept of C. D. 847. Objectives of C. D. 848. The essence of the programme, 849. Contents of the programme, 850. Organisation and administrative set-up, 852. Implementation of the programme, 854. Resources of the programme, 858. Evaluation of the programme, 858. A critical review of the working of the programme, 859. General appraisal, 869. Remedial measures, 870. Ant-yodaya Programme, 871. Minimum Needs Programme, 878.

31. VILLAGE PANCHAYATS**888—925**

Historical development, 888. Causes of decay, 891. Royal Commission on Decentralisation, 892. Montague-Chelmsford Reforms and after, 894. Decentralisation after Independence, 894. Panchayats under the planning period, 894. Implementation of the scheme, 897. Objectives of Panchayati Raj Institutions, 898. Pattern of Panchayat organisation, 899. The system of elections, 900. Functions of Panchayats, 901. Panchayat Committee of Local Self-Government of Ministers' Conference, 903. Finances of Panchayats, 904. Administration of Panchayats, 907. Critical appraisal of the working of the Panchayati Raj, 909. Suggestions for improvement, 912. Asoka Mehta Committee on Panchayati Raj Institutions, 913. Appendices, 916.

32. LAND TENURES LAND REVENUE AND AGRICULTURAL TAX**926—965**

Land tenure, 926-948 : Importance and meaning, 926. Under Hindu period, 927. Under Muslim period, 928. Under British rule, 929. Systems of Land Tenure on the eve of Independence, 931 : Raiyatiwari, 933. Mahalwari, 935. Zamindari, 937. Permanent settlement, 933. Temporary settlement, 944. Tenancy Legislation, 948. Land Revenue, 950-958 : Land revenue administration, 952. Incidence of land revenue, 954. Defects of land revenue system, 957. Abolition of land revenue, 958. Taxation on farm income, 958. Case for agricultural income-tax, 960. Committee on Taxation of Agricultural Wealth and Income, 963.

33. LAND REFORMS**966—1011**

Need for Institutional changes, 966. Nature and objectives of Land Reforms, 969. Policy on Land Reforms during the Plan period, 971. Implementation of Land Reforms, 974-1000. Abolition of Intermediaries 974. Regulation of Rent, 980. Security of Tenure, 981. Rights of Ownership, 986. Evaluation of Tenancy Reforms, 986. Ceiling on Land Holding, 988. Record of Rights, 991. Co-operative Land Management, 991. Review of the Land Reforms Policy, 992. Nanda Committee's Findings, 994. Planning Commission's Survey on Progress of Land Reforms, 994. Observations of the Task Force, 997. Policy Issues for Future, 1000. Bhoodan Movement, 1001-1009. Land Distribution Schemes, 1009.

34. RURAL UNEMPLOYMENT**1012—1031**

Types of under-employment, 1012. Magnitude of unemployment, 1013. Nature of Unemployment and Under-employment, 1017. Under employment in rural areas, 1018. Causes of rural unemployment, 1020. Remedial measures, 1021. Development of Rural Industries, 1024. SFDA, MFLA and DPAD Schemes, 1029. Food for Unemployment Programme, 1030. Employment in Non-agricultural sectors, 1031.

35. COTTAGE & SMALL SCALE INDUSTRIES**1032—1054**

Cottage and Small Scale Industries, 1032. Genesis of the Development of these Industries, 1034. Importance of village industries, 1037. Classification of Cottage Industries, 1039. Some important village industries, 1040-1044. Small Scale Industries 1044-1048, Role, 1045. Present plight of village and small scale industries, 1045. Problems of cottage and small scale industries, 1046. Cottage and small scale industries under the plans, 1048. Government Policy Measures, 1053. District Industries Centres 1054.

36. AGRICULTURE UNDER THE SIXTH PLAN**1055—1070**

Objectives and strategy of Agricultural Programmes, 1058. Programmes, for Agricultural Production, 1057. Targets, 1058. Animal Husbandary and Dairying, 1059. Fisheries Development, 1060. Forestry, 1061, Dry Farming, 1061. Inputs and Services, 1063. Irrigation Development Programmes, 1065. Flood Control Measures, 1066. C.A.D. & W. Management, 1067. Crop Insurance, 1067. Cooperation, 1068. Targets for Coop. Operations, 1070.

37. TABLES**1071—1095****SELECTED READINGS****1096—1104**

1.

Natural Environment

The natural resources of a country are of primary importance for the development of the economic life of its inhabitants. As a matter of fact natural resources determine the economic life of a nation. England, for example, is an industrial country but she owes her present position to her coastline, rivers, the proximity of rich coal mines and iron fields, and the temperate climate. The U.S.A. is both an agricultural as well as industrial country. It possesses the requisites of industrialisation and at the same time its soil at some places is very fertile. Japan, too, is an industrial country only because there is no scope for agriculture as the very nature of the soil is not favourable for agriculture. Man may grow rich in knowledge and intelligence, however much he may have overcome nature but ultimately he will have to depend on the materials supplied by Mother Nature for the development of his economic life. The physical factors like topography, soils, geologic formation, climate and the available flora and fauna, are the basic influences which lead to differences in land use, cropping pattern, settlement and density of population and occurrence of minerals, water and power resources in different parts of the country.¹ In the case of India, a study of agricultural problems should start with an investigation of the physical, edaphic and climatic factors.

In the north lies Himalaya which separates it from China, in north-west lies Pakistan and in the east it is flanked by Burma, separated from it by Assam hills. In the south it is bounded by the Arabian sea in the west and by Bay of Bengal in the east. Sri Lanka lies on its south-eastern tip. In the Arabian Sea stand the Lakshdip (Laccadive, Amindivi and Minicoy) and in the Bay of Bengal are the Andaman Nicobar Islands.

GEOGRAPHICAL SITUATION

The Republic of India is a vast country which lies wholly in the northern hemisphere stretching from latitudes $8^{\circ} 4' 28''$ and $37^{\circ} 17' 53''$ north and from longitudes $68^{\circ} 7' 33''$ to $97^{\circ} 25' 47''$ east. It is one of the central and the largest of the three irregular peninsulas of Southern Asia possessing a highly favourable position as regards the rest of the world for purposes of international trade. It measures 3,214 Km from north to south and 2,933 Km. from east to west. It

1. Planning Commission, *Resource Development Regions and Divisions of India*, 1964, p. 3.

has a land frontier of 15,200 Km. and a coastline of about 6,100 Km.¹ Tropic of Cancer divides it into two unequal halves, the northern half lying in the temperate zone and the southern half in the torrid zone.

India has an area of 32,87,782 sq. km. with a population of 54,79,49,809 in 1971 as against 43,90,72,582 in 1961. The population in mid-1977 was estimated at 58.15 crores. It comprises 22 States and 9 Union Territories. Out of the total population, the proportion of rural to total population was 80.13 in 1971 as against 80.02 in 1961.

While India accounts for 16 p. c. of the world's population, it has only a 2.4 p. c. share in the land surface of the world. In a relative sense, India's position in this respect is distinctly unfavourable. In the terms of geographical area, India ranks seventh among the countries of the world after U. S. S. R., U. S. A., Canada, China, Brazil and Australia in that order. India's area is one-seventh of that of the U. S. S. R. and one-third of that of the U. S. A., Canada or China. But no less important is the fact that, in absolute terms, the geographical area of India is quite large—3.28 million sq. km. This is equivalent to two-thirds of the geographical area of Europe, exclusive of the U. S. S. R. An important feature of the Indian area is that most of it is in the service of man. In Russia and Canada, on the other hand, vast areas remain buried under perpetual snow. In Australia there are large areas of desert useless for man. In Brazil, there are vast areas under tropical forests. Even in the U. S. A. more than 2.8 million sq. kms. are included in the western states which are mostly a desert. This consideration naturally places India in the forefront among the countries of the world.

India's large size carries a few advantages. *Firstly*, in a country of so large dimensions, a variety of mineral resources are found. *Secondly*, the large size is associated with a variety of climates, and with this variety of climate goes the variety of crops, viz., she grows from tea to pepper and from saffron to cashewnut. Besides, India's long coastline has its own economic advantages. In fine, its geographical area is one of its greatest assets.

PHYSICAL FEATURES

Topography of the Land

Of the total land area of 328 million hectares about 3.5 m. hectares or 10.7 p. c. lies in mountains.² Nearly two-third of such mountainous tracts, 22. 3m. hectares are found in Jammu and Kashmir. The remaining one-third is distributed in Eastern India, 5.9 m

1. Govt. of India, *India* 1977 and 1978, p. 1.

2. *Mountains* comprise of steep land at a very high elevation and generally exclude all land less than 210 meters above the sea level.

hectares, North-West India, 3.9 m. hectares and North India 3.2 m. hectares. In these mountainous areas, nearly 95% of the land is unsuitable for agriculture.

Hilly tracts¹ comprise 61m. hectares or 18.6% of all land in India. Of this 21.1m. hectares lie in East India ; 13.5 m. hectares in central India, 11.3m. hectares in South India, and 8.0 m. hectares in West India.

Plateaus² measure 103m. hectares or 27.7% of all land in India. Almost half of the plateaus is found in Central India, and the rest is distributed as 12.1 m. hectares in North-West India, 11.5m. hectares in South India and 8.3 m. hectares in East India.

Plains cover 141. 6 m. hectares or 43% of the total land in India. These are distributed all over the country and are most suitable for cultivation. However, in these plain areas are also found unsuitable land such as the salt marshes of the Rann of Kutch and the sandy deserts of western Rajasthan which are not suitable for cultivation.³

The mainland comprises three well defined regions : (i) The great mountain zone of the Himalaya; (ii) the Indo-Gangetic Plain; and (iii) the Southern tableland.

(1) *The Great Mountain Zone of the Himalaya.* The Himalaya run for about 2,400 km from the Pamir knot in the north-west to the border of Assam—with a breadth varying from 240 to 320 km and covers about 500,000 sq km. They comprise three parallel ranges interspersed with large plateaus and valleys like those of Kashmir and Kulu which are fertile, extensive and of great scenic beauty. Some of the highest peaks in the world are found in these ranges, i.e., Mt. Everest 8,848 m. and Kanchanjunga 8,598 m. The high altitudes limit travel only to a few passes notably the Jelep La, Natu La, and Shipki La. In the east, these ranges are much lower and are known by different names in different parts such as the Patkoi and the Naga hills in the north-east and the Jaintia, Khasi and Garo hills in the south-west of Assam. These, running almost east-west, join the chain of Lushai and Arakan hills running north-south.

(2) *The Indo-Gangetic Plain.* Between the folded mountains of the north and the stable tableland of the peninsula lies the vast plain drained by three river systems. In the far west are the Bias and Sutlej draining into Arabian Sea; in the east, Ganges and its tribu-

-
1. *Hills* include all kinds of weathered highlands which are about 210 metres above the sea level.
 2. *Plateaus* include those areas which are relatively flat areas which lie between 300 metres and 900 metres above the sea level.
 3. *Census of India, 1951, Vol. 1, Pt. I-A, Report, 1951, p. 8.*

taries (which flow into the Bay of Bengal) and Brahmaputra in the farther east. The Delhi Ridge divides it into two parts, viz., the Western plain and the Eastern plain. The plain is a part of a great depression which is traceable across northern Africa, southern Europe, and southern Asia. It occupies an area of more than a million sq. km. and covers more than 2,400 Km. from east to west with a width of 240 to 320 Km. It is wholly composed of the sediment deposited by the three rivers of northern India and is literally "the dust of mountains."¹ No rock-bed is disclosed by borings of 165 to 333 meters. It is the region of the deepest soil in India with great thickness of clay, loam, silt, etc. There is hardly any variation in relief. It is one of the greatest stretches of the flat alluvium and also one of the most densely populated areas on earth.²

(3) *The Southern Plateau.* This is an elevated plateau separated from the Indo-Gangetic plain by the Vindhya and Satpura ranges, ranging from 500 to 1335 metres covering about 16,00,000 sq. km. It is the part of the earth's outer shell that is composed in great part of generally horizontal rockbeds that stand upon a firm and immovable foundation and that have for immense number of years remained so impassive amidst all the cataclysm and revolutions that have again and again changed the face of the earth.³ The rocks composing this plateau are the various gneisses and other crystalline rocks and there is a great richness of mineral wealth associated with them. Overlying these rocks is a great thickness of unfossiliferous rocks. The rift valley in which river Narmada flows divides the whole plateau into two irregular parts. The northern is known as the *Malwa plateau* and the southern as the *Deccan tableland*. On the Malwa plateau are to be found large areas of ravines (formed by Chambal and its tributaries which are quite unfit for cultivation. The soil which this trap yields is reddish to brownish soil, known as the *black cotton soil*, which represents one of the most fertile soils of India.

The peninsula is flanked by coast ranges known as the Western and the Eastern Ghats. The former are much more considerable and form a gigantic and continuous seawall rising over 2440 meters above the sea level. The latter are much less formidable (only 610 metres high) and are broken and discontinuous and interrupted by many broad valleys of the rivers such as the Mahanadi, Godawari, Krishna and Cauvery all of which flow into the Bay of Bengal. The rivers of the peninsula are rain-fed and hence, they dry up during the summer. Their courses are rapid and abruptly descend from a higher to a lower level and are, therefore, of little use for irrigation. Irrigation is practised by tanks and reservoirs.

Between the Ghats and the sea are the narrow strips of land on both the sides of the plateau. These have been formed by the wear-

1. T. W. Holderness, *People and Problems of India*, 1904, p. 34.

2. *India*, 1978, p. 2.

3. D. N. Wadia, *Geography of India*, 1939, p. 2.

ing down of the oldest tableland into coastal plains. *The Western coastal plains* are very narrow and are 64 km. wide in some places. On this coast the monsoon floods bring enormous silt and help the growth of large forests and plantation crops. Coconut palms, bananas, arecanuts, cashewnuts, mango, pineapples, rubber, rice, spices and cardamoms are largely grown. The shores of these plains have few creeks (i.e. lagoons) and inlets which are joined by canals. They serve for good coastal traffic by boats and rafts, and in these fishes are caught.

The Eastern coastal plain. It is wider and the beach is surf-beaten and is intersected by numerous swift-flowing rivers. The lower section of the plain consists of the deltas of the rivers and is entirely alluvial. While the upper section consists of plains in the courses of the rivers and, hence, is partly alluvial and partly peneplain. These plains produce good crops of rice, sugarcane, jute, coconut, mangoes, bananas, spices (like pepper and ginger), cardamom, arecanut, and sago palms.

CLIMATE

Owing to the great size, position and the diversities of relief there are greater striking contrasts of meteorological conditions in different parts of the country than are probably found in any other part of the world. One part of the country lies north of the tropic and the other within it. In the north-west lies the great Thar desert with an average annual rainfall of less than 12.5 cm. In the north-east are the Khasi hills with an average of 1150 at Cherapunji.¹ Dras in Kashmir has recorded a minimum temperature of 9°C, while Sri Ganganagar in Rajasthan has several times recorded a maximum temperature of over 50°C. Hill-stations in the Himalaya, such as Simla or Nainital may be shrouded in cloud for days together in August with humidities of 100% ; while in December they may be overrun by air of nearly 0% humidity. The mean maximum temperature at Cochin does not go above 89°F in any month nor the mean minimum below 15°C, while at Ganganagar the mean maximum temperature goes up to 48°C in May and the mean minimum to 8°C in January.

The climate of India is influenced from outside by two adjoining areas. On the north the Himalayan ranges shut it off from the cold climate of Central Asia and give it a '*continental climate*', the characteristics of which are "the prevalence of land winds, great dryness of air, large diurnal range of temperature and little or no precipitation." On the south, the ocean gives it a '*hot monsoon climate*' more typical of the tropical than of the temperate zone. "We always think of India as essentially a tropical country. And rightly so, for the whole

1. "Some have claimed that the record should now go to another nearby village Mowsynram (25° 18' N 90° 35' E), which has a mean annual rainfall of 449 inches"—P. K. Das, *The Monsoons*, 1968, p. 17.

area within mountain-wall must be considered as a unit, with a common type of climate throughout, that of tropical monsoon, the chief features of which are "great uniformity of temperature and hence small diurnal range of temperature, great dampness of the air and more or less frequent rains during the south-west monsoon period."

Temperature

For purposes of climatological studies India may be divided into two parts : Peninsular India and Northern India.

The whole of Peninsular India lies within the tropics and has a tropical climate, the variations of temperature between summer and winter being small. In winter the temperatures are controlled by the proximity of the Equator and the oceanic influences and it is between 18°C and 22°C . But in summer the temperature rises over 14°C near the tropics. In the neighbourhood of the oceans the climate is equable and the atmosphere is generally cloudy. In Malabar, the range of temperature is about 15°C and in southeastern Tamil Nadu about 3°C . These features are specially observable on the windward coasts and they diminish with increasing distance from the sea.

Although the whole of northern India lies beyond the Tropic of Cancer, here the climatic conditions are more complex. The severity of heat or cold and the amount of moisture in the air, however, differ greatly in the different states and during different seasons. Punjab and western Rajasthan are very cold in winter and extremely hot in summer and air is generally devoid of moisture. But in West Bengal, Assam, Bihar, and U.P. winter is cold and summer is moderately hot with plenty of moisture in the air. In winter the temperature in northern India is controlled, apart from the slanting rays of the sun in winter, by the anticyclone that covers this area then. The temperatures vary between 12°C and 18°C . The summer temperatures are largely the effect of : (i) direct rays of the sun, (ii) continentality emphasising land influences far from the sea, (iii) anticyclone, which maintains steadily rising temperatures, and (iv) modification by the south-west monsoons. The highest temperatures are to be found in the neighbourhood of the M. P., Rajasthan, south-west Punjab and western U.P.

Altitude tempers the heat of low latitudes. Upon the hills it is delightfully cool and refreshing even in mid-summer, but beyond a certain point the excess of cold forbids human habitation.

Seasons

The climate of India may be broadly described as a tropical monsoon type. India enjoys three well-marked seasons: (i) a *cool dry season*, from October to the end of February, when northerly dry trade winds prevail over the greater part of India, the skies are clear, the weather fine and the humidity low so that there is little or no

rainfall except in the northern parts where moderate cyclonic storms occasionally occur ; (ii) a *hot dry season*, from the beginning of March to middle of June, usually comes suddenly with heavy thunderstorms and dry scorching westerly winds (known as *loo*) ; and (iii) a *hot wet season*, from middle of June to end of September, with winds of oceanic origin, high humidity, much cloud and frequent rain.¹

Monsoon and Rainfall

The most important feature in the meteorology of India is the alternation of seasons known as 'monsoon'. During winter, the general flow of surface air over the country is from north to south, north-westerly in the northern plains, northerly in the central parts and north-easterly in the south of the Peninsula and the neighbouring seas. In this season the air over the country is mainly of continental origin and, hence, of low humidity and the season is known as the *north east monsoon season* or *winter season*. In the summer months the general flow of winds is from the opposite direction i.e., from sea to land and the season is one of much humidity, cloud and rain. The direction of winds in the major parts of the Arabian Sea and the Bay of Bengal being south-westerly, the season is named the *south-west monsoon season* or *wet summer season*.

(i) *South-West Monsoon Season*² (1st June to 30th Sept.). During this period 74% of the total rainfall is recorded. The monsoon sets in June, spreads almost all over the country by July and August and gradually gets weakened in September. During the period rains are very important because they provide necessary moisture for agricultural operations for sowing of *kharif* crops which account for more than 80% of the total area sown to crops. Thus, the setting in of the south-west monsoon marks the beginning of the agricultural operations over a wide area. The south-west monsoon generally spreads through two branches, viz., the Arabian Sea Branch and the Bay of Bengal Branch. The former brings rainfall to the southern and western parts of the country, but, as the monsoon advances, it penetrates further into the central and north-west India. The second branch comes slightly later and confines itself to Assam, West Bengal and north eastern India.

(ii) *The Post monsoon Season*. (1st October to 15th Dec.) The post-monsoon season begins with October, and extends upto Decem-

1. The Meteorological Department of the Government of India, Pune, recognises four seasons :
 - (i) the cold weather (winter) season (December—February) ;
 - (ii) the hot weather season (summer) (April-May) ;
 - (iii) the rainy season, south west monsoon period (June—September) ;
 - and (iv) the season of retreating south-west monsoon (October-November) i. e., the transition period."
2. V. S. Menon, "*Weather and Crop Conditions in India*" in *Agriculture Situation in India*, Vol. IX No. 7 Oct. 1954 p. 432 ; *Ibid*, for August, 1962 pp. 557—60 ; *Ibid*, for August 1964, pp. 482-484.

ber. It provides only 13% of the annual rainfall. Normally good post-monsoon showers are received in three months in the eastern region comprising Assam, West Bengal, Orissa, Tamilnadu, Andhra Pradesh and parts of Kerala and Maharashtra. In other parts of the country only light occasional showers are received and the intensity of these showers decreases from east to west. But these light showers are very important for the growing of the late-sown *kharif* crops, especially in southern India as well as for the sowing of *rabi* crops. The rains during this period are of considerable local importance.

(iii) *Winter Monsoon Season.* (15th December to 15th March) Winter monsoon commences in January and lasts up to the end of February. Though this provides only 3% of the annual rainfall, this is important for the proper growth of *Rabi* crops in northern India, especially wheat, barley, gram and pulses in the Punjab, Haryana, U. P., Bihar, M. P., Rajasthan and parts of Assam.

(iv) *Pre-Monsoon Season.* Pre-monsoon showers during March to May amount roughly to 10% of the annual rainfall. This period of the year is generally dry over the land mass of northern and peninsular India where *rabi* crops are harvested and the irrigated crops are grown. But the stronger winds near the sea-coast, which increase in strength as the monsoon advances, brings rain to the north-eastern part of the country consisting of Assam, West Bengal, Orissa, Bihar and the north-west coast of Karnataka and Kerala, and south east Tamil Nadu. In the north-east region they help the sowing of autumn paddy and maize, while in the southern areas, these rains are beneficial for the sowing of *kharif* crops like paddy, coffee, sugarcane and some vegetables on land where irrigation facilities are available.

Importance of Rainfall

The annual average rainfall of India is 120 cms. which yields an annual precipitation of 400 million hectare metre,¹ and variations from this normal—as great as + 30 cms. and—20 cms.—occurred in 1917 and 1899 respectively. A feature of considerable importance is the variability of monsoon rainfall. The variation ranges from 12.5 cms. in the desert areas of Rajasthan to nearly 1100 cms. in the hills of Meghalaya. Generally the variability decreases with increasing rainfall, the variability being largest in the driest parts of the country and least in the wettest regions. The high variability in areas of low rainfall is, however, not such a serious menace to agriculture as the comparatively low variability in areas which have just enough rainfall for agricultural purposes. Any decrease in rainfall in such areas makes it impossible for agricultural operations to be carried on and a famine is the result. As average rainfall diminishes from place to place and as it becomes more concentrated in one

1. Report of the National Commission on Agriculture 1977, p. 186.

season, variations from year to year increase. When the normal total is under 50 cms. no agriculture is attempted without irrigation, and rainfall fluctuations are expected and planned for. Where the total exceeds 200 cms. there is almost always a surplus of moisture available for growing of crops. 100 cms. of rain is normally adequate but when it fails, famine is threatened. Thus, *the most seriously affected areas are those where the rainfall is between 75 and 125 cms. and this is the famine zone of India.* In Rajasthan, Saurashtra, Central India and parts of Andhra Pradesh and Tamil Nadu where some rain usually comes but the variation is great, famine descends frequently. In this area there is enough rain for crops during normal years so that adequate provision of irrigation facilities does not exist. This fact is the source of considerable suffering in times of drought. Long experience with rainfall fluctuations has brought population distribution into close agreement with climatic possibilities but so great is the pressure of people that many have occupied the marginal lands where drought is certain to occur. In certain areas, notably Punjab, Tamil Nadu western U.P., Haryana and northern Rajasthan irrigation has made the settlers somewhat independent of rainfall changes, but a prolonged failure of monsoon causes rivers and wells (the source of irrigation) to have less water than usual and thus to be less adequate for irrigation.

Characteristic Features of monsoon Rains

The monsoon rains in India are often marked by some important variations from the normal, viz., (i) The beginning of the rains may be delayed considerably over the whole or a large part of the country, (ii) It may end much earlier than usual causing damage to *kharif* crops and also make the sowing of *rabi* crops difficult or uncertain. (iii) There may be prolonged breaks of rain lasting over the greater part of July or August, when the summer crops needing plenty of moisture are just growing. (iv) The rains may persist more than usual in one part of the country and desist from another part. (v) It is concentrated for a few months—fluctuations in which as regards climate, distribution and timeliness bring misery or prosperity to millions of people. For several months in a year, India is on trial for her life and seldom escapes without a penalty.¹ (vi) The normal duration of the monsoon varies from two to four months. It begins to withdraw from north-west by mid-September and from south by middle of December. (vii) Over 80 percent of India's annual rainfall is recorded in the monsoon months. The south-west monsoon accounts for 80% of the rainfall of India both seasonally and regionally. Much of the rainfall is caused by the rather fortuitous orientation of mountain barriers, although convective phenomena also play an important part. There is also a small quantity of rain even in other seasons too e.g., south has its 'mango showers' in the months

1. C. A. Knowles, *Economic Development of British Empire Overseas*, Vol. II, p. 278

of March to May, while 'spring storms' bring rain to West Bengal and Assam, then retreating monsoons bring rain to south-east coast during September to December. (viii) It is unevenly distributed over the country. The sharp transition from heavy rain to dire scarcity is testified by the old proverb, "One horn of cow lies within the rainy zone and one without." (ix) It is erratic, sometimes falling in torrents and heavy downpours leading to a considerable run-off. This results in excessive soil leaching and soil erosion. (x) There are large variations in the amount of rainfall from year to year. (xi) The variation from the normal are greatest where the rainfall is least. Rajasthan and Gujarat have shown the highest variations while Kerala and West Bengal have shown the least. Droughts frequently occur in the interior districts of Cuddapah, Kurnool, Anantpur in Andhra Pradesh, while at the same time, the adjoining parts of Tamil Nadu may be suffering from deluges and floods. (xii) The driest tracts of the country have heavy down-pours when compared with the temperate countries, where the average rainfall is less than 0.25 cm in 24 hours. In India a rainfall of 50 cm in a day is common, the highest record was round about 86 cm in a period of 24 hrs in Bihar (at Purnea), and 57 cm in Andhra Pradesh (at Nellore).

Variability of Rainfall

A very important aspect of rainfall in India is its variability. Variability from normal, when it is as low as 10 %, is serious in areas of modern precipitation where the precipitation is just enough for the crop produced there. It is in such areas that famines occur. In these areas variability ranges from 20 to 50% (as in the peninsular and north western India).²

High variability, over 30% is characteristic of the western section of the continental India where precipitation is moderate to low. Because of this low precipitation land-use is based on irrigation facilities on 'risk' basis. Precipitation below the normal in any year, does not take the people unawares ; precipitation above the normal is a pleasant surprise.

Low variability below 15% is characteristic of areas of high precipitation as in the North-east and south-west India. Here precipitation below the normal could be unhelpful because the total quantity increases above the high normals and tends to inundate vast areas.

Climatic Regions

The Census of India divided India into five clear-cut rainfall regions as given below :³

1. Ronaldshay, *India, A Birds-Eye-View*, p. 152.
2. K. Parthasarthy, *Monsoons of the World*, 1958, pp. 185-194.
3. *Census of India*, 1951, Vol. I Pt. I—A. Report.

Rainfall belt		Annual rainfall (cms)
1. Blue Belt	} covering about 1/3 of the total area.	Exceed 190
2. Dark Green belt		Between 126 and 190
3. Light Green belt		Between 76 and 125.
4. Brown Belt	} remaining one third of the total area	Between 38 to 75
5. Yellow Belt		Below 38

A map of India outlining the areas which have different amounts of rainfall shows that approximately one-third of the total area has a rainfall in excess of 125 cms. per year. This quantity is enough for intensive agriculture during the rainy seasons and often leaves a residue in the soil adequate to produce a winter crop such as wheat or grain, sorghum, etc. In addition, the rainfall in this area is more dependable than in areas of lower average precipitation, although there are occasional seasons when the monsoon is feeble even in these moister regions. In such seasons drought frequently damages crops even though the average rainfall is high. Moreover, a significant proportion of this area of heavy rainfall is in the Himalayan region where the topography prevents cultivation, except of perennial crops like tea and fruits in certain suitable locations. These regions of heavy to very heavy rainfall also contain some badly eroded areas.

The area having rainfall of 75 cm. to 125 cm. annually covers another one-third of the country. This amount of rainfall is generally adequate for fair to good crops, but less adequate than it would be in the temperate latitudes. Here the monsoon is also somewhat less dependable than in the area with a higher average annual rainfall. Short crops are not infrequent in this area, especially as the lower limit of rainfall is approached. Moreover, in the 75 to 100 cm. portion of this region the soil less frequently retains enough moisture from summer rains to insure a winter crop of any importance.

Another one-third of the country has an annual precipitation of 75 cm. or less. Here the seasonal fluctuations are so frequent that they are more or less regularly expected and when they occur, they cause a great deal of hardship to the people and expense to the government. The yellow belt (having 37.5 cm. or less of rainfall and containing 7 per cent of the land area) has so little rain that a great many people do not live there. The brown belt (having 37.5 cm. to 75 cm. of rainfall and containing 24 per cent of the land area), where one-fourth of our people live is exposed to especial hazards which are a permanent problem for the people and the Government. This area of light and highly variable rainfall, although

much of it is topographically usable, must remain an area of relatively low productivity, except where it can be irrigated and not a great deal more of it is irrigable.

On the basis of rainfall, four broad climatic regions may be demarcated :

(a) Practically the whole of Assam and the west coast lying at the foot of the Western Ghats and extending from north of Bombay to Trivandrum are *areas of heavy rainfall*.

(b) The Rajasthan desert extending to Kutch, and the high Ladakh region fall under *regions of moderately low rainfall*.

(c) A broad belt in the eastern part of the peninsula merging northward with north India plains and southward with eastern plains falls under *regions of moderately high rainfall*.

(d) A belt extending from the Punjab plains across the Vindhya mountains into the western part of the Deccan, widening considerably in the Mysore plateau comes under *area of low rainfall*.

The normal annual rainfall varies from about 11,680 mm in Assam hills and 7,620—10,160 mm at suitably exposed positions on the crests of the Western Ghats to less than 75 mm in Rajasthan. The following statement shows the areas under assured rainfall region, medium rainfall region and dry region.¹

Assured, Medium Rainfall and Dry Regions

<i>Quantity of Rainfall</i>	<i>Regions</i>	<i>% of the total area</i>
1. Assured (115 cms. and above in a yr.)	Assam, Arunachal Pradesh, Bihar, Gujarat, Kerala, M. P., Tamilnadu, Maharashtra, Karnataka, Orissa, U. P., Punjab, Haryana, Bengal, H. P., Andaman & Nicobar Islands, Manipur, Tripura, Meghalaya, Laksha Dweep.	29.6
2. Medium (Between 75 cms. & 115 cms. in a yr.)	Andhra Pradesh, Bihar, Gujarat, Kerala, M. P., Tamilnadu Maharashtra, Karnataka, Punjab, Haryana, Rajasthan, U. P., Bengal.	21.2
3. Dry (Below 75 cms. in a yr.)	Andhra Pradesh, Bihar, Gujrat, J & K., Kerala, M. P., Tamilnadu, Maharashtra, Karnataka, Orissa, Punjab, Haryana, Rajasthan, U.P., Delhi.	49.6

1. Ministry of Food and Agriculture, *Indian Agriculture in Brief*, pp.28-29

Effects of Climate on Agricultural Economy

Life in India is primarily based on agriculture, which is dependent for its very existence on the monsoons (particularly the south-west monsoons). *This monsoon may be said to be the pivot upon which the whole of Indian economic life swings.* In one season India is deluged with rain and is the scene of most wonderful and rapid growth of vegetation ; in another period the same tract becomes dreary, sun-burnt and waste. In fact, "if monsoon fails, there is a lockout in agriculture industry, a disaster which calls forth the virtues of patience, fortitude and charitableness."¹

As winter temperatures are never too low in any part of the country, the growing period for the crops is prolonged so that two crops are grown. In parts of West Bengal, Assam and the peninsular coastal region, owing to availability of sufficient water supply, as many as three crops of rice are grown. The summer temperatures are high and rise suddenly hence crops mature earlier. This rapid maturity of crops tends to deteriorate their quality. *India is, therefore, not a 'quality' producer, but only a 'quantity' producer.* This applies to winter crops as well as summer crops.

The weather fluctuations and destructive meteorological phenomena which affect crops adversely in India are : floods, droughts, storms, depressions and untimely rains, thunderstorms, hailstorms and duststorms, heat waves, cold waves and frost, excessive or defective insulation, and high winds.

The uniformly high temperatures during monsoon season are of great benefit for the quick growth and maturity of crops like millets, pulses, sesamum, cotton and maize. The hot and moist climate of this period produces an abundant vegetative growth in plains which serve as a fodder for cattle. As the rainfall is concentrated to only few months, the greater part of the year is dry. This fact discourages the growth of grasslands in India. Whatever grass grows during the rains is scorched during the dry season. Hence, pasturage is poor in India and cattle and other livestock have, therefore, to be stockfed.

The extreme uncertainty and uneven distribution of rainfall in various parts of the country and its compression into one or two months, have necessitated the practice of irrigation more universally and on a large scale in India than in any other part of the world. Further, through centuries of experimentation, Indian farmers have developed crop varieties and agricultural practices which fit in with this pattern of precipitation.

Agricultural Regions

Dr. Cressy has rightly said, "Nowhere else are so many people so intimately dependent upon rainfall rhythms, the whole prosperity in India is held up with the eccentricity of its seasonal rainfall."²

1. Vera Anstey, *Economic Development of India*, 1926, pp. 15-16.

2. G. B. Cressy, *Asia's Land and People*, 1963, p. 396.

In determining agricultural and animal husbandry regions of India, factors like rainfall, temperature, altitude, latitude, natural vegetation, soils, crops and live-stock are taken into consideration. When all these factors are taken into account, what strikes one is their uniformity over wide belts of territory embracing many States. It should, however, be noted that transition from one region to another is gradual, and it is only in the central areas that the differences emerge in full contrast.

Many authors have also attempted to divide India in specific agricultural regions, such as Stamp¹ Simkins² and Spate³ took geographical factors like topography, climate and density of population. Dr. Chen Han Seng divided India into 16 regions on the basis of topographical situation, agricultural water supply, crop-system, land tenure system, and general economic development.⁴

Dr. Thorner also divided India in 16 well marked regions. These were divided on the basis of socio-economic system : types of land holding and concentration of control, labour supply ; control of credit marketing, processing, shop keeping, topographical features and related crop patterns ; economic organisation of agriculture, cultivation holding, and over-all degree of modernisation.⁵

K. William Easter has classified regions for agricultural planning and management into different categories ; one is the crop regions appropriate for central production planning of major crops, and another agro-climatic regions for use in over-all agricultural planning. He divides crop region in seven major crops and three other crops on the basis of percentage contribution of a district to total national production of a crop and the percentage of the districts gross cropped area under the crop as the main criteria. These regions are cotton regions (6), groundnut regions (10), sugarcane regions (8), maize regions (7), jawar regions (9), Wheat regions (9), Rice regions (12), millets regions (14), Pulse regions (13) and oilseeds regions (13).

His agro-climate regions are based on climate, soils, geology and cropping differences. He divides the country into three main divisions, 10 sub-divisions and 52 regions (excluding the Himalayan regions).⁶

The National Sample Survey Organisation has divided the country into 25 main agricultural regions, with 66 sub-regions by

1. L. D. Stamp, *Asia Regional and Economic Geography*, 1958.
2. E. Simkins, "The Agricultural Geography of the Deccan Plateau of India." *The Geographical Teacher*, Supplement no. 2, 1926, pp. 13-14.
3. O. H. K. Spate and A. M. Learmouth, *India and Pakistan*, 1960.
4. Chen Han Seng, *Agrarian Regions of India and Pakistan*, 1950, p. II.
5. D. Thorner, "Rational of Regional Variations in Agrarian Structure in India," *Indian Journal of Agricultural Economics*, 1956, pp. 46-52.
6. *Agricultural Situation in India*, August, 1973, pp. 331-332.

grouping within each state/unions territory districts or parts of districts having similar population density and crop pattern, and having similar altitude above sea level and also having good transport and communication facilities.¹

According to Dr. Randhawa, the following regions can be defined :²

1. Temperate Himalayan Region. This region is usually divided into two sub-divisions :

(i) *The Eastern Himalayan Region.* This includes Mishmi Hills in Upper Assam, Sikkim and Bhutan. Rainfall is heavier (over 250 cms.) in the outer ranges and there are thick forests of sal. This is mainly a tea-growing area. Cultivation of paddy is done in some place.

(ii) *Western Himalayan Region.* This includes Kumaon, Garhwal, Simla hills, Kulu and Kangra valleys, Himachal Pradesh and Jammu and Kashmir State. The climate is dry but in northern parts there is more winter rainfall. Horticultural crops—particularly walnuts, almond, apples, cherries, apricots, peaches, pears and plums—occupy a high place. Other cultivated crops are potato, maize and paddy. Goats and sheep are principal domestic animals providing meat and wool. Bee-keeping is also done.

2. Northern Dry (Or Wheat) Region. This comprises the Punjab, Haryana, Delhi, North Gujarat, western U.P. and parts of west M. P. and Rajasthan. Annual rainfall is less than 75 cms. and in many places even less than 20 cms. The soil is alluvial and sandy. Wheat, barley, gram, maize, jowar, bajra and cotton are the chief crops. Camels are found exclusively in this region. Horses, donkeys, sheep and goats are also common. The cattle in the region are adequately fed as there is comparatively a large area under fodder crops and wheat straw is also available in abundance.

3. Eastern Wet (Or Rice) Region. It includes Assam, Meghalaya, Arunachal Pradesh, Mizoram, Tripura, Manipur, West Bengal, Bihar, Orissa, eastern U. P., Andhra Pradesh, Eastern Tamilnadu, Kerala and eastern M. P. Annual rainfall is over 153 cms. The soil is mainly alluvial. The main crops are rice, jute, sugarcane and tea. The area under fodder crops is the smallest. Rice being the staple crop, its straw is used as cattle feed. Buffalo is the favourable domestic animal.

4. Western Wet (or Malabar) Region. It comprises Kerala, western coastal strips, Karnataka and adjoining areas. Annual rainfall is over 253 cms. The soil is lateritic. This region is important from the point of view of plantation crops, but coconut is the

1. Quoted in C. B. Mamoria's *Geography in India* 1975, pp. 691-692.

2. M. S. Randhawa, *Agriculture and Animal Husbandry in India*, 1958, pp. 73-75.

predominant crop besides tapioca, cashewnuts, arecanuts, rubber, spices, black pepper and cardamom. Rice is the main food crop.

5. Southern (Medium Rainfall or Millet) Region. This comprises southern U. P., south Gujarat, M. P., western Andhra Pradesh, western Tamilnadu, eastern Maharashtra and parts of Karnataka. Rainfall is between 50 cms. and 100 cms. The soil is partly black cotton and partly lateritic. Jowar, bajra, groundnut, castor seed and cotton are the chief crops. There are more sheep in this region than in any other but most of these do not produce good quality wool.

An important classification of the country into 4 macro-agricultural regions, 25 macro-agricultural and 60 micro-agricultural regions has been given by Sengupta and S. Dayuk. These regions are.¹

1. The Himalayan Zone, covering Jammu and Kashmir, Himachal Pradesh, Kumayun Himalaya and its foot hills, Darjeeling district of West Bengal, Assam Himalayan including Arunachal Pradesh. In this zone, the rainfall varies from 125 cms. to 250 cms. Much of the mountainous tracts are negative areas from cultivation and settlement point of view. Only 7% of the area is available for cultivation. The leading crops are wheat, maize, rice, buck-wheat, marketing gardening, particularly seed potatoes, and a host of temperate fruits.

2. The West Zone, comprises in most part the north-eastern peninsular plateau (plateaus of Chota Nagpur, northern Orissa, Bastar plateau, Central parts of Madhya Pradesh, upper Mahanadi basin and Kaimur hills) Eastern hills and plateau (Manipur, Mizo hill districts, Garo hills, United Mikir and North Cachar hills district, Nagaland, Kachar valley, United Khasi and Jaintia Hills). A relatively small part of it is shared by the alluvial plains consisting of Ganga delta and northern Brahmaputra valley, Jalpaiguri district of west Bengal; Bhagirathi delta; Orissa coast including Mahanadi delta, west coast stretching from Surat district to Kanyakumari district (including Cambay coast, north and south Karnataka coast, and north and south Malabar district). The rainfall here is from 100 to 125 cm. Irrigation is normally not necessary and rice is the predominant crop. Other crops grown are tea, jute, oilseeds, gram, millets, wheat, sugarcane, spices, arecanut, banana, jack-fruit and coconut.

3. Sub-Humid Zone, embraces the upper and middle Ganga plain (Ganga and Jamuna doabs, tarai region, south Ganga plain, eastern district of U. P. and its contiguous Champaran district of Bihar); a vast stretch of land in peninsular India from Bundelkhand plateau through the heart of the lava plateau down to the east coast

1. P. Sen Gupta and G. S. Dayuk, *Economic Regionalisation of India, Problem and Prospects*, 1968, pp. 102-116.

region (including the plateaus of Bundelkhand, Malwa, South eastern Maharashtra, northern and southern Telangana, Karnataka. Tamil Nadu, Wardha basin, upper Tapti valley, Malnad and Maidan tract of Karnataka, northern and southern Andhra coast, Krishna-Godawari deltas, and south eastern Tamil Nadu coast.

The rainfall varies between 75 to 100 cms. The proportion of cultivated region reaches a high figure wherever water is available for irrigation. The most intensively cultivated areas are the Ganga plain and the east coast deltas, where proportion of cultivated land to the total area goes to about 70%. Wheat, sugarcane, rice, gram, maize, millets, cotton, groundnut, oilseeds and tobacco are the main crops.

4 The Dry Zone, embraces in the north-west, north and south Punjab plains, Haryana, Western, U.P., Rajasthan desert plain and semi-desert plain, Kutch peninsula of Gujarat, and in the south a long-strip of the peninsular plateau in the lee of the ghats (including Tapti-Narmada doab area, upper Godawari, Bhima and Krishna basins Tungbhadra basin and Rayalseema plateau).

The rainfall is about 75 cms. a year. Except in the alluvial plains of Punjab and Haryana, the entire dry area suffers from acute shortage of water. Millets, gram, wheat, oilseeds, cotton, and groundnut are the main crops.

TYPES OF SOILS

The investigation of Voelcker in 1893 and of Leather in 1898 led to a classification of Indian soils into four major types, viz., (i) Indo-Gangetic alluvium, (ii) black cotton soils (iii) red soils; and (iv) laterite soils. The Indian Council of Agricultural Research set up an All-India Soil Survey Committee, which reported in 1963. It divided Indian soils in 8 different categories. some of which are quite inclusive of a rather wide variety of soil conditions while others have quite uniform and consistent soil characteristic throughout. These eight soil groups are : alluvial, desert, soil saline and alkaline soils, peaty and marshy soils, black soils, red soils, laterite soils, and mountain and hill soils.

The soil map prepared by the Indian Agricultural Research Institute, shows 27 broad soil classes in India. According to it, the approximate areas of these classes of soils are :—

1. Planning Commission, *Study on Wastelands and Their Reclamation Measures*, 1963, p. 1, *Indian Agriculture in brief*, 1977, pp. 21-22.

S. No.	Type of Soil	Approximate area in (m. hectares)
1	2	3
1.	Alluvial Soil	101.2
2.	Alluvial Soil, highly Calcareous	8.9
3.	Coastal Alluvium	8.5
4.	Deltaic alluvium	17.0
5.	Alluvial Soil, affected by Salinity & Alkalinity	6.9
6.	Desert Soil	14.6
7.	Deep Black Soil	6.9
8.	Medium Black Soil	18.6
9.	Shallow Black Soil	4.9
10.	Black Soil affected by Salinity & Alkalinity	6.9
11.	Black Soil undifferentiated	12.5
12.	Mixed Red and Black Soil	10.5
13.	Red Soil	30.4
14.	Red Gravelly Soil	1.6
15.	Red & Yellow Soil	17.8
16.	Laterite	10.1
17.	Laterite & Laterite soil	2.0
18.	Brown Soil Under Deciduous	1.6
19.	Grey & Brown Soil	3.6
20.	Hill Soil	2.4
21.	Podsollic Soil	3.6
22.	Forest Soil Laterised	6.5
23.	Foot hill/Terai Soil	5.7
24.	Mt. Meadow Soil	11.7
25.	Skeletal Soil	2.4
26.	Peat muk	0.2
27.	Other Soils	11.8
Total		328.8

Alluvial Soils : These soils occupy extensive tracts of land in about 15 lakh sq. km. in northern, north-western and north-eastern parts of India and include greater parts of Rajasthan, Punjab, Haryana, Uttar Pradesh, north western parts of Delhi, Bihar, parts of Assam (central Areas of Lakhimpur, Darang, Sibsagar, Kamrup, Goalpara) parts of Garo Hills, West Bengal ; Orissa ; the valleys of Narbada and Tapi and in the Mahanadi basin in Balaghat, Durg, Bastar, Raipur and Bilaspur districts in M. P., deltaic areas of Godawari, Krishna and Cauvery in Southern India, and the strips extending along the Eastern and Western coasts of the peninsula (in the river deltas and the Malabar coast respectively). They also occur in Ahmedabad, Vadodra and Kheda districts of Gujarat. The depth of this soil exceeds 600 metres below the ground surface. In North

India these soils are derived mainly from the debris brought down from the Himalaya or from the silt left by the old sea which has now retreated. Geologically, the alluvium is divided into *newer and older alluvium*. The former (known as *khadir*) vary mostly from clayey to sandy loam in texture and are generally acidic in reaction. They are light coloured and of less kankary composition. These soils are deficit in lime, phosphoric acid and humus. The latter (known as *Bangar*) are more clayey in composition, generally of dark colour and fully kankary.

These soils are red coloured and differ in consistency from drift sand to loam in texture and are generally acidic in reaction. In other places they vary from fine silt to stiff clay. A few occasional pebbles are also present.

These soils differ in different parts of the country in physical texture and chemical composition. In north and north-west India it is dry, porous and in some places sandy giving rise to crops not requiring the retention of a great deal of moisture about their roots. In West Bengal, it becomes more compact, less coarse and moist where rice, sugarcane and jute are largely cultivated ; while in the deltas of the peninsular India, it is actually clayey, non-porous and of dark colour. In Assam, these soils are less acidic in reaction, sometimes neutral or slightly alkaline.

Although these soils are rich in potash, phosphoric acid, lime and organic matter they are deficient in nitrogen and humus contents. These soils are capable of fixing nitrogen very rapidly through leguminous crops. These soils are of marvellous fertility producing under irrigation splendid crops of rice, sugarcane, tobacco, banana, cotton, wheat, jute, maize, oilseeds, vegetables and fruits. The regions of these soils are heavily populated, and constitute the "*wheat and the rice bowls of India*"

The Desert Soil : They occur under arid and semi-arid conditions and occupy large tracts in Rajasthan, Haryana and south Punjab, lying between the Indus valley and the Aravallis occupying about 1.42 lakh sq. km. The Thar desert alone occupies an area of 106,000 sq. km. The sands, with which it is covered, are partly derived from the disintegration of adjacent tracts but are largely blown in from the coastal regions of the Rann of Cutch and the Indus valley.

These soils contain high percentage of soluble salts, low loss on ignition, varying percentage of calcium carbonate and are poor in organic matter, the limiting factor being mainly water. These soils may be reclaimed if proper facilities of irrigation are available. Very few crops, specially coarse millets, jowar and bajra are grown for want of water supply and hence population supported by the regions is very small. But Ganganagar district, under the influence of Gang canal and areas irrigated by Rajasthan canal have now become the leading producers of wheat, gram and cotton.

Saline and Alkaline Soils. These soils occur on about 68,000 sq. km. of area in the drier tracts of north specially of Bihar, U. P., Haryana, Punjab and Rajasthan and all over the state of Maharashtra. The soils give rise to saline and alkaline efflorescence. These soils are popularly called *Reh*, *Kallar* and *Usar*. Large areas, once fertile, have become impregnated with salt with highly deleterious effects on cultivation.

In Gujarat, the area around the Gulf of Cambay is affected by sea tides carrying laden silt deposits. Nearly 1,73,530 sq. km. comprising the estuaries of the Narbada, the Tapi, the Mahi and the Sabarmati have been damaged due to saline and alkaline efflorescence. It has been estimated that about 12,503 sq. km. of land in U. P., and 12,000 sq. km. in Punjab have been affected by *usar* and 100 sq. km. are being added every year in the Punjab. The total area of such soils in the country has been estimated to be about 85,000 sq. km. spread along the sea coasts comprising states of Gujarat, Maharashtra, Karnataka, Kerala, Andhra Pradesh, Tamilnadu, Orissa and Goa.

Texturally they are sandy to loamy sand. The alkaline soils are deficient in calcium and nitrogen and are highly impervious and have very low water holding capacity. On these soils are produced a wide variety of crops including rice, wheat, cotton, banana, sugarcane, coconut and tobacco.

Peaty and Marshy Soils. Peaty soils originate in the humid regions as a result of an accumulation of large amounts of organic matter in the soils. These soils cover about 150 sq. km. The soils are generally submerged under water during the monsoon. As soon as the rains cease, the soils are put under paddy cultivation. The soils are black, heavy and highly acidic, and contain 10 to 40% of the organic matter. On these soils, paddy is grown when water recedes.

Marshy soils are found in coastal tracks of Orissa, in the Sundarbans and other places in West Bengal, in the central portion of North Bihar, in the Almora district of U. P. and in the south-east coast of Tamilnadu. There are occurrences of muck and very humus soils in low lying situations. They contain about 18% of the organic matter.

Both these types of soils are highly saline, rich in organic matter but deficient in phosphate and potash.

Foot-hill or Tarai Soils. These soils cover about 56,600 sq. km. area in Jammu and Kashmir, U. P. and West Bengal in the sub-montane tract at the foot of the Himalaya. In U. P. this tract runs as a narrow belt from the district of Dehra Dun to Deoria. These soils are particularly deficient in phosphate but are inherently rich in nitrogen and organic matter. In West Bengal, these are mainly sandy, raw humus type and deep black to grey black in colour. The soil is acidic and poor in bases and available plant food material. The soil is generally covered by all grasses and shrubs, under re-

claimed conditions good crop of paddy, wheat, soyabean and sugar-cane are grown.

Mountain and Hill Soils. These soils cover about 13,300 sq. km. mainly in Jammu and Kashmir, H.P., Punjab, U.P., Bihar, West Bengal, Assam, Tripura, Manipur, Meghalaya Arunachal Pradesh and Nagaland, etc., Most of these soils are low in lime and are acidic. In areas of good rainfall, these are rich in humus and very fertile for the cultivation of plantation crops like tea, and temperate fruits. They may also be used for growing paddy.

Black Soils. These soils may be of various kinds such as deep black, medium black, shallow black or chestnut. They cover an area of about 546,000 sq. km. These soils are found in the states of Andhra Pradesh, Maharashtra, Karnataka, Gujarat, M. P. and some parts of Tamilnadu, southern Rajasthan and in U.P.

The black soils extend in depth even upto 3 metres, and more. Their chief characteristics are their high fertility, highly argillaceous character, comparative richness in lime, high proportion of magnesium carbonate, ferrous-oxide and aluminium oxide. They contain sufficient quantities of potash and phosphoric acid.

These soils are highly retentive of moisture and extremely compact and tenacious when wet, and rich in chemical properties. They are generally rich in iron, lime, calcium and magnesium carbonates, and alumina but are poor in phosphorus, nitrogen and organic matter. The potash content is available. In general, this soil is clayey and fine textured with dark colour. Since the content of water soluble salts is high, these soils are unsuitable for heavy irrigation. Because of retentivity of moisture, fineness and chemical matters, (especially lime), these soils are endowed with inexhaustible fertility. Both *kharif* and *rabi* crops are grown over it. Cotton, wheat, chillies, linseed, jowar, virginia tobacco, castor, safflower, and millets are the chief crops. Vegetables of different kinds and citrus fruits can also be grown successfully.

Red Soils. Such soils comprise practically the whole of Tamilnadu, parts of Karnataka, south-east Maharashtra, north-east Andhra Pradesh, Goa and strip of the tract running along the eastern parts of M.P. to Chota Nagpur and Orissa. In north, its area extends into and includes the greater part of the Santhal Pargana in Bihar, the Birbhum, Bankura districts of West Bengal, Mirzapur, Jhansi, Banda and Hamirpur districts of U.P., northern portion of M.P., the Aravallis and the eastern half of Rajasthan ; southern part of Assam, Meghalaya, Nagaland, Manipur and Tripura covering in all about 5.18 lakh sq. km. of area.

The red soils differ greatly in consistency, colour, depth and fertility. On the uplands, they are thin, poor and gravelly, sandy, or stony and porous, light coloured soils on which food crops like bajra can be grown. But on the lower plains and valleys they are rich, deep dark coloured fertile loam on which, under irrigation can

be produced excellent crops like cotton, wheat, pulses, millets, groundnut, sugarcane, potatoes, and fruits. Since these soils are airy, they need irrigation for cultivation.

Laterite and Lateritic soils. These occur most extensively and cover an area of about 2,48,000 sq. km. They are well developed on the summits of the basaltic hills and plateaus of M.P., West Bengal, Eastern Ghat region of Orissa, south Maharashtra, Karnataka and parts of Assam, Meghalaya, and in Santhal Parganas of Bihar.

These soils are generally poor in nitrogen, potash and potassium and organic matter but are responsive to nitrogen and phosphate manuring and, hence, produce good crops.

Red and Yellow Soils. These soils are spread over 1,98,000 sq. km. of area in M.P., Rajasthan and Tripura. These soils are poor in phosphorus, humus are somewhat acid. They differ in fertility and produce a number of crops under irrigation, and are suitable for paddy, sugarcane, wheat and cotton.

Conclusion

It will be observed that the soils of India offer a distinct contrast to those of many other countries, inasmuch as they are very old, fully matured, and so not in many cases show pedogenic processes and the close relationship between the soil and its rocky substratum. The weathered materials in most cases have been transported to great distances by various agencies. The majority of the soils in India are of ancient alluvial origin. An examination of these shows that although the nature and composition reflect to some extent the composition of the original rocks from which they are derived, they are the result to a considerable extent of the climate, particularly the amount and seasonal distribution of rainfall. Other soils mostly of the Peninsula, are diluvial and these remain in the areas where they are formed and, thus, there is no mixing of different rock materials. The fertility of these soils depends upon the chemical constituents of the rocks from which they are derived.

In the midst of varying features two characteristics are to be found common to almost all soils. First, their comparative dryness. This absence of moisture in the lands makes the supply of water an absolute necessity in Indian agriculture. Second, a major proportion of soils is deficient in nitrogen and organic matter. The phosphate deficiency is comparatively less marked while potash deficiency is rare.

2.

Problem of Soil Erosion

The denudation or the cutting away of soil particles by natural agencies like rain, wind or running water is called the erosion of soil. According to Dr. Bennett "The vastly accelerated process of soil removal brought about by human interference, with the normal disequilibrium between 'soil building' and 'soil removal' is designated as soil erosion".¹ It can best be described as "the theft of the soil by the natural elements and is the removal of soil particles either singly or in mass."²

Agents of Erosion

Several agents are responsible for effecting soil erosion. These may be indicated thus :

(1) **The Concentration of Rainfall.** The more concentrated and intensive the showers, the more forcefully they strike the surface and the greater the run-off erosion loosening the particles and forming the deep ravines. It has been estimated that rainfall of abnormal intensity once in 50 years is sufficient to cause the heaviest erosion in one single year compared with the erosion caused in the previous 49 years.

(2) **The General Slope of the Ground.** On a steeper slope the soil is washed away much more rapidly than on the gentler slope. On the steeper slopes, landslips and land slides due to percolation of water and instability of slopes owing to the gravity is common and frequent. In places where the ground is flat, the erosion has more pronounced effects as in the peninsular parts of India particularly in M.P. and Bundelkhand than in the alluvial plains of the Ganga.

(3) **The Nature of the Soil.** The structure, texture and organic matter contents of the soil also affect soil erosion. Light open soils lose more silt than heavier loams. Heavy black cotton soils, which swell up when wet, are probably not denuded as rapidly as the lighter soils found in the peninsula. The dry tracts are also affected by water which rushes over them. Again, the soft shale and sandstone erode more readily than limestone and granite and, hence,

1. H. H. Bennett, *Soil Conservation*, 1939, p. 94.

2. R. H. Gorie, *Soil and Water Conservation in the Punjab*, 1946, p. 1.

the erosion in the Siwaliks is more severe than in the Gurgaon hills. The silt carried by water also aids in soil erosion. By abrasion or friction it increases both the lateral and vertical erosion (i.e., both on the sides and the bed stream).

(4) **The Carrying Capacity of Running Water.** The eroding capacity of the water is closely associated with its velocity. For example, if the velocity is doubled, the carrying capacity of the run off is increased for an average size of particles by 64 times; and if the velocity is trebled, the capacity is increased to an alarming figure of 729 times.

(5) **Nature of Plant Cover.** The greatest loss due to soil erosion occurs when the ground is bare of vegetation, because it is unable to absorb rainwater effectively as does the surface covered by a thick mantle of plants.

Thus, "the heat of the sun, the rain drops, the severe blasts of the wind, the cold of the winter season, the roots of the plant, the insect life, the human life, and bacterial life are all acting upon the earth's surface resulting in tremendous biological, chemical and physical changes leading to the crumbling down of the hard rocky surface of the earth into pieces, which are ultimately displaced by wind and rain and carried and transported by these on the lower and flatter areas. The process is both destructive and constructive".¹

Soil erosion is profoundly and directly effected by water. Quickening of the pace of erosion has produced erosion land forms and other conditions which are definitely abnormal—rills, gullies, sub-soil exposed by sheet erosion, land slides, undercut high ways and reservoirs and channels filled with it.

Types of Soil Erosion

Soil erosion usually takes two forms according to the agents bringing about this menace, viz., water erosion and wind erosion.

In *water erosion*, the soil is chiefly eroded by water in three forms, viz.

(1) In *sheet erosion*, the soil is eroded as a layer from the hill slopes, sometimes slowly and insidiously and sometimes more rapidly. Sheet erosion is more or less universal on : (a) all bare fallow land ; (b) all uncultivated land whose plant cover has been thinned out by grazing, fire or other misuse ; (c) all sloping cultivated fields and on sloping forest and scrub jungles whose natural porosity of soil has been reduced by heavy grazing, clear felling of trees or burning.² Sheet erosion is common in the Himalayan foothills ; over the north-eastern parts of the peninsula ; in Assam and in the Western and Eastern ghats.

1. M. S. V. Raman Rao, *Soil Conservation in India*, 1964, p. 24.

2. *National Planning Committee Report on Soil Conservation and Afforestation*, 1948, p. 73.

(2) When sheet erosion is allowed to continue unchecked, the silt-laden run-off forms well-defined minute finger-shaped groves over the entire field. Such thin channelling is known as *rill erosion*. Such type of erosion is active over a wide area in Bihar, U. P., M.P., and in the semi-arid areas of Maharashtra, Karnataka, Andhra Pradesh and Tamil Nadu.

(3) In *gully erosion*, the water forms small rivulets which wash away the soil from gullies. First there is the main ravine and then side rivulets form lateral gullies. The phenomenon once started, and if not checked, goes on extending and ultimately the whole land is converted into a 'bad land topography'. Gully erosion is more common : (a) where the river system has cut down into elevated plateaus so that feeders and branches carve out an intricate pattern of gullies ; and (b) in relatively level country whenever large blocks of cultivation give rise to concentration of field run-off. The *chos* of Northern Haryana and Punjab and the bedland of M.P., Rajasthan and U.P., have been formed because of the gully erosion on an extensive scale.

(4) During sudden floods, the fast flowing river undercut the banks and erode the beds. Wherever there is a bend the flowing water gets suddenly twisted and due to increased torsion the outer bank caves in alongside. The eroded material is deposited along the opposite bank nearby. This is known as *stream bank erosion*.

Wind Erosion. This is responsible for three types of soil movement in the process of erosion, viz.,

(i) *Saltation*, when the soil is carried by wind in a series of short bounces. This is caused by the direct pressure of the wind on soil particles.

(ii) *Suspension*, when the particles of soil are very fine they are carried over long distances resulting in a complete loss to the eroded area.

(iii) When the particles are too heavy to be moved in saltation, they are pushed or spread along the surface.

Wind erosion takes place normally in dry areas, where the wind velocity may be high ; and in the absence of a ground water, the top soil is blown off in dust particles. When dry wind velocity comes down, coarse particles are deposited rendering the land infertile. It is more common all over Rajasthan and in the adjoining areas of Haryana, U.P., Rajasthan and Gujarat.

Causes of Soil Erosion

While it takes nature 100 to 400 years to build one centimetre of top soil man can and often does destroy it almost overnight by haphazard land use and improvident husbandry. Jacks and Whyte have rightly remarked that, "cultivation, deforestation or destruction of natural vegetation by grazing or other means unless carried out according to certain immutable conditions imposed by each region

may so accelerate denudation that soil, which would normally be washed or blown away in a century disappears within a year or even within a day."¹

Failure of rains, floods, depopulation and loss of cattle caused by famine and pestilence, disturbances caused by war and interference with or change in the natural drainage system have had their deleterious effect on our soil at some time or the other. The different kinds of cover result in a loss of soil per year in the following proportion :²

Forest with normal ground covering	1
Forest burnt annually and litter removed (or heavily grazed)	20%
Well-managed pasture	14
Grassland	130
Completely bare ground	3,250

Let us examine these factors in somewhat detail.

1. Deforestation. The destruction of forest covers for the supply of timber and fuel by deliberate human interference leads to increased run-off of rain water and its diminished seepage and storage in the soil. The decomposing forest litter is no longer replenished by fresh falls of leaves or decaying roots so that plant remains and soil organic matter gradually diminish. The structure of the soil suffers, the run-off increases. It loosens the soil and transport it. The water develops power enough to cause devastating floods. Soil loss and surface run-off increase with the intensity of the slope as will appear from the following table :—

Slope	Run off			
	Low Inten- sity Run-off (%)	Soil Loss (tons per Acre)	High Inten- sity Run-off (%)	Soil Loss (tons per Acre)
630 ft.	13.5	5.7	20.3	32.86
315 ft.	16.5	6.35	18.0	18.26
157 ft.	28.0	7.68	10.8	8.64

In a natural forest, roots of the trees go deep into the soil and penetrate into the cracks and interstices of the rocks.³ The force of rain is broken by the leaves of trees and thick carpet of the vegetation, while surface covering of soil and the humus soak up the rain-water like sponge and let it sink into ground to emerge later on in springs and streams. When rain falls gently, the whole is absorbed

1. Jacks and Whyte, *The Rape of the Earth ; A World Survey of Soil Erosion*, p. 20.
2. H. Howard, *Post-War Forest Policy in India*, 1944, p. 30.
3. H. Howard, *Op. Ctt.*, p. 31.

and violent storm floods in the streams is lessened. The following table explains the effects of vegetation on checking soil erosion :—

<i>Nature of cover</i>	<i>Loss of water</i>	<i>Loss of soil (in tons per acre)</i>
(1) Forest	1	1
(2) Grass	27	32
(3) Bare land	125	800

According to the researches of the Dry Farming Research station at Sholapur, to erode a surface soil of 17 centimetres it takes different years as shown below :

Native grass not cut	1965 years
Groundnut	324 "
Fallow land	201 "
Native grasses cut	50 "
Bajri, Tur	38 "
Jowar	24 "

Deforestation in the upper reaches of the Sutlej and Beas rivers have resulted in extensive soil erosion on the Punjab and Haryana states.

2. Destruction and Overgrazing of Pastures. A properly managed, lightly grazed pasture might form a permanent protection to the soil because it provides an efficient cover for preventing erosion and reducing run-off inasmuch as it covers the surface of the ground protecting it from the direct impact of the falling rain-drops and thus keeping the pores of the soil open and capable of receiving excessive amounts of water. But when there is over-grazing by cattle, goats and sheep, the soil becomes uncovered as the grass over-grazed becomes worn and thin, rain-drops begin to fall directly on the soil puddling the surface and clogging up the pores with mud, infiltration into the soil is reduced and the run-off of the water increases. All this invariably leads to a deterioration in botanical composition and an increase in the growth of weeds as well as to an increase in the area of bare ground.¹ This over-grazing has done much harm particularly in the western foothills of the Himalaya, Siwaliks (Himachal Pradesh) lower hills in Poonch (Kashmir) ; Bihar, M.P. and eastern Rajasthan, in low rainfall areas of Maharashtra, Karnataka and Andhra Pradesh.²

1. "This is also collaborated by the example of Palestine, where centuries of uncontrolled grazing has destroyed the forests and arable cultivation in the hills and has reduced the quantity and quality of the soil."— D. Warner, *Land and Poverty in the Middle East*, 1938, p. 32.
2. H. Glover, *Soil Erosion*, pp. 8-9.

3. Shifting Cultivation. Man's ruthless destruction of the forest for shifting cultivation has also decreased the area under forest. Shifting or *jhuming* cultivation is chiefly practised by the primitive tribes for raising food for them. According to this system of farming a patch of forest is selected. Its trees and bushes are then cut and burnt down on the ground in order to clear room for a field. The ground is, then, lightly ploughed and the seed is sown broadcast and raked into the soil, at the first fall of the rains, which is immensely fertile owing to the wood ashes and accumulated humus. After two or three years' crop, the soil is exhausted so that the crops are so poor as not to repay the labour of cultivation, and then another felling takes place and the first is abandoned for 3 to 16 years. The woods are set on fire annually to improve and open out the grass for pasture, or to facilitate bear hunting. Such type of nomadic cultivation is known as *Jhum* in Assam, *Bewar*, *Podu* and *Dahya* in Madhya Pradesh, *Khil* in Himalaya, *Poonam* in Kerala and *Kumari* in the Western Ghat.¹ All these wasteful ways of subsistence are being followed on a much larger scale in the districts of Sirohi, Udaipur, Dungarpur and Banswara in Rajasthan etc., as the forest tribes of Bhils, Sahariyas, Garasias and Meenas find it more and more difficult to live by robbery and being pent up within their own wilds are compelled to draw their food from the soil.² The total area affected by shifting cultivation in the country is estimated at 20 to 26 lakh hectares.³

4. Faulty Methods of Cultivation. Faulty methods of cultivation and ploughing of unstable slopes have resulted in millions of tons of the most fertile soil of India being carried down the rivers and deposited uselessly in the sea.⁴ When the virgin land is ploughed and naked soil is exposed to the rain the loss of the fertile soil is enormous, particularly on the steeper slopes. The crops produced on poor soils also grow poorer and poorer in each succeeding year until the land becomes unculturable and is left fallow. The potato cultivation in Himalaya and the Nilgiris, where the rows run straight up and down hill, causes an abnormal rapid loss of soils; elsewhere the fields are ploughed without regard to the prevailing slope and the soil is lost which might have been preserved by plough along the contours.⁵

5. Nature of Crop Grown. In arable agriculture, crops vary widely in their effect on erosion losses. While barley, oats and wheat have "low units of index" of soil loss; corn, sorghum, cotton, soyabean have "higher units of index."⁶ In India, it has been

1. *Imperial Gazetteer of India*, Vol. III, p. 25.

2. *Rajputana Gazetteer*, Vol. I, p. 23.

3. *Abridged Report of the National Commission on Agriculture*, 1977, p. 217.

4. H. Glover, *Op. Cit.*, p. 13.

5. H. Glover, *Ibid.*

6. O. C. Ayres, *Soil Erosion and its Control*, 1936, p. 10.

noticed that dry crop producing regions (such as millets, maize, tobacco, potato, cotton and even wheat growing regions) of high temperature, low humidity and scanty rainfall are attended by heavy loss in soil specially at the time of a heavy shower. In contrast to these rice, jute and sugarcane account for very little loss of soil.

6. Economic and Social Factors. Certain economic factors arising out of the traditional outlook, social economy and economic structure of the community have also indirect bearing on the soil erosion. Of these, the system of farming, size of the farm tenancy, tenant-landlord relationship are too significant facts to be overlooked. Bad agricultural practices also lead to the loss of top fertile soil.

Thus, wanton destruction of forests, unregulated and excessive grazing by cattle, goats and sheep, intensive felling of trees to obtain supplies of fuel and timber, the indiscriminate clearance of forests for personal extension and improper land use are important factors leading to soil erosion.¹ In addition to the soil erosion from cultivated fields, neglected pastures and waste lands, considerable road-side erosion also takes place due to defective highway engineering.²

In the words of Kellog, "soil erosion is an important symptom of bad relationship between people and soil, just as headache is often a symptom of some more fundamental illness."³

MAGNITUDE OF SOIL EROSION PROBLEM

Soil erosion is the greatest single menace facing Indian agriculture. Over a large part of India, the people have accepted a slowly deteriorating environment as a part of the scheme of things, the vast majority is probably unaware that erosion is taking place.

The process of soil erosion had been going on for centuries. This is evidenced by the ruins of Taxila and Harappa (Pakistan). There was a time when Bijapur was the capital of a flourishing kingdom. Now it presents a picture of devastation and famines are its recurring feature.⁴ Again, as early as the time of Alexander the Great, there were thick forests and well populated cities in the north of Kutch and south of Punjab which now form part of Rajasthan desert. All this has taken place because of wind erosion that developed on account of misuse and abuse of land. Similarly, Surat was a large commercial city but its population has reduced from 8

1. *Third Five Year Plan*, 1961, pp. 370-371.

2. I.C.A.R., *Handbook of Agriculture*, p. 372.

3. C. E. Kellog, *The Soil That Supports Us*, 1956, p. 304.

4. D. C. Kaith, etc., *A Soil Conservation and Land Utilisation Programme for India*, p. 3.

lakhs to much less during the last 50 years. This is attributed to the sedimentation of Tapi river, caused by erosion in uplands.¹

Although no systematic survey has been carried out in the country as a whole to determine the extent of soil erosion, yet some estimates have been made by some authorities which show the gravity of the situation. Some of these are given below :

According to one author, "no less than 123 million acres of land in India are in the process of either soil erosion or exhaustion caused by primitive methods of farming."²

The First Plan Review has observed that "of the total area, about 200 million acres of land were exposed to the hazards of wind or water erosion, and of lands actually under cultivation, about 100 million acres are vulnerable to soil erosion."³

According to the Second Five Year Plan, "a random soil survey has revealed that 71% of the area in the scarcity areas has been severely eroded of which 26% of the land has been rendered useless for agricultural purposes."⁴

It has been estimated that the loss of soil through erosion of arable land is of the order of 6,000 million tonnes a year, with a total annual depletion of nitrogen to the extent of nearly 2.5 million tonnes valued at Rs. 1,000 crores of rupees.⁵

According to *Bhagirath* magazine "on an average an area of 10,000 hectares is affected by erosion every year, involving an average loss of Rs. 500 lakhs."⁶

Investigations have shown that in the bare fallow fields in the foothills of northern India (except properly levelled rice land) a single storm leads to the loss of soil at the rate of 14 tons per acre ; while in the Bombay-Deccan there is a loss of 133 tons of soil per acre per year from a field of jowar. In Bombay survey of 50,000 acres carried out at 28 centres showed that 17 to 23% of the area is not affected by erosion, while over 60% is affected to such an extent that only 9" of the soil is left.⁷ Such scouring is specially acute in India along the Himalayan foothills and sloping grounds throughout northern India, in parts of Tamilnadu, the Maharashtra, Karnataka and the other states including Madhya Pradesh and Chota Nagpur plateau. It has been estimated that the amount of soil lost by

1. P. C. Bansil, *Agricultural Planning for 700 Millions*, p. 321.

2. Mayadas, *Between Us and Hunger*, p. 14.

3. *Review of the First Five Year Plan, 1957*, p. 138.

4. *Proposal for the Second Five Year Plan*, p. 117.

5. P. V. Sheno, *Agricultural Development in India, 1975*, p. 152.

6. *Bhagirath*, Vol. XVIII, 1971, p. 53.

7. S. Thirumalai, *Post-War Agricultural Problems and Policies in India, 1954*, p. 1668.

erosion ranges from 1 to 115 tons per acre in different parts of India.¹ It has been further held that every year 1/20 of an inch of the top fertile soil is washed away by the rains in India.²

Along most of the bigger rivers soil erosion has led to the formation of a vast and intricate network of fissures and finger gullies and the loss of invaluable agricultural land so that soil erosion is responsible for 3.67 m. hectares of ravine lands in Uttar Pradesh, M.P., Rajasthan and Gujarat along the banks of rivers flowing in north central direction viz. the Yamuna, the Chambal, the Mahi, the Sabarmati and their tributaries. On a conservative estimate the country is losing a total output worth about Rs. 157 crores annually by failure to reclaim and develop the ravines.³ The man-made desert, between Rajasthan and U.P., is now intruding its thirsty tongue into the south-western districts and for partial filling of the reservoirs and choking of irrigation course in the Punjab, Haryana and U.P. A cattle-made desert is extending over several hundreds of square miles in the heart of the world's most fertile plain.⁴

Affected Areas by Water Erosion

Problems of water erosion are particularly severe along the Brahmaputra and its tributaries in Assam, rivers of North Bengal like Tista and Torsa, the Hooghli in south Bengal, Ganga in Bihar, Yamuna and Chambal in U.P., Rajasthan and M.P., and Mahi and Sabarmati in Gujarat.

The damage done to the areas, in different states, by water erosion is distributed as below :—⁵

Andhra Pradesh	80.93 Lakh hectares
Assam	2.12 „
Bihar	19.44 „
Gujarat/Rajasthan	73.01 „
H.P.	2.18 „
Maharashtra	138.61 „
Karnataka	80.95 „
Orissa	31.12 „
Punjab	30.23 „
U.P.	36.42 „

-
1. J. Russel, *Report on the Work of Imperial Council of Agricultural Research*, p. 68.
 2. *The Villager's Guide Calendar*, 1941, p. 132.
 3. *Abridged Report of the National Commission on Agriculture*, p. 210.
 4. N. P. C., *Report on Population* pp. 54-55.
 5. Planning Commission, *Report of the Study on Wastelands and Their Reclamation Measures*, 1963, p. 151.

Approximately 16.67 million hectares of land have been affected by ravines (3.67 hectares) saline, and alkali 7.0 m. hectares and water logged areas, (7.0 m. hectares).

U. P. The intensity of water erosion can best be judged from the fact that in the Yamuna-Chambal basin the amount of soil eroded is estimated to be equivalent to the removal of 12 cusecs or 1/2 ton of soil per second per day and night without stopping for the last 1000 years.¹ The damage caused to the soil by ravines can be comprehended by the examples of extensive wastelands in Agra, Mathura and Etawah districts. The ravines of Yamuna and Chambal rivers form almost a compact mass with extreme length of 70 miles and breadth of 13 miles in the centre. In Etawah alone there are about 1,20,000 acres of ravine land.

The wastage in the Etawah district as a whole has been estimated to be not less than 11 cubic feet of soil per second, equivalent to a steady outflow of earth in stream 13 feet wide and 2 feet deep flowing at the rate of 3 miles per hour. It has been ascertained that the process of erosion and ravine formation commenced within the last 400 years.² It is in the Chambal-Yamuna tract that the tangle of wild and sterile ravines sloping from the uplands to the river bank shows its worst features. As far as can be seen one meets here a labyrinth of rugged ravines and green valleys covered with acacia jungle every prominent bluff showing the ruins of some robber stronghold. This has been for centuries a no-man's land occupied by wild Rajput tribes, robbers and raiders by profession, who settled on the flank of the Government highway through the Doab and were a thorn in the side of the Muslim administration.³ It has been estimated that the total area of such desert-like and inhospitable ravines in U.P. alone is about 3.5 million acres.

Similarly, the barren and uncultivated areas in Oudh contain many large trees whose roots are entirely laid bare by unchecked sheet erosion, and more than a foot of the soil has been carried away in the course of about 200 years.⁴ Other cases of the same kind abound in Fatehpur Sikri tahsil of Agra as also in many parts of Bundelkhand.

Rajasthan and M.P. Along the banks of the Chambal in the districts of Dholpur, Karauli and Kota one finds thousands of hectares devastated by soil erosion. The ravine land of Chambal is the worst offender in this respect. Many lakhs of hectares of

1. Tahir Rizvi, Presidential Address of the Section on Geography and Geology to the Indian Science Congress, 1941.
2. R. K. Mukerjee, "Broken Balance of Population—Land and water," in *Indian Journal of Economics*, 17th Conference, 1934, p. 256.
3. Crooke, *North-Western Province of India*, p. 26.
4. S. L. Agarwal, "Soil Erosion in U. P.," in *Indian Journal of Economics*, Vol. XII, July 1930, p. 78.

cultivable lands have been destroyed and the ravines continue to cut back into plateau cultivation. Mr. A.F. Hamilton has correctly described the unreclaimed country along the lower course of the river (Gwalior district) as a sea of brown ridges and troughs with a few browsed relics of the desert species.¹ In this territory land has been "hopelessly cut up into winding and tortuous ravines some of which are so big that they can hide whole armies. They have given shelter to gangs of dacoits. Far from being suitable for cultivation the land, desiccated and barren is hardly fit even for pasture. These ravines are the most glaring and tell-tale example of the gully type of soil erosion and havoc wrought by it.² The absence of protective vegetation and the flow of water from the high plateau to the river caused this complicated network of ravines.

Terai. The Himalayan rivers, which had built up the upper plains of the Ganga valley, have cut deep channels in the plains which they originally formed, and actually erode gradually but continuously carry away the silt which they once laid on them. Not only this but at each bend the concave bank is being eroded, while the opposite shore receives a new alluvial deposit to fill up the void left by the receding river.

W: Bengal. Gully erosion is noticeable in the rolling uplands of Burdwan division. In many places the accumulated top soil has been washed away and the subsoil exposed due to sheet washing. In the lower Bengal bank erosion is serious along all the major rivers and the loss affects urban areas as well as cultivable ground to an alarming extent.

Bihar. In Bihar both sheet and gully erosion do immense damage, the main cause being uncontrolled grazing and faulty field cultivation.

Maharashtra. In Maharashtra the dry areas with less than 40 inches of rain run off are subject to water erosion. Measurements taken for black cotton soil cultivation at Sholapur confirm the loss of 133 tons of soil per annum from well-tilled field.

Areas Affected by Wind Erosion

With increasing soil erosion the area gets drier and drier and as the wind breaks the trees, hedges and grass cover vanish, the area becomes more liable to dust and storm. Wind erosion is generally found in the desert areas of the Punjab, Haryana, western U. P. and western and northern Rajasthan (Jodhpur, Jaisalmer, Bikaner, Kotah, Jaipur and Bharatpur districts).

In the desiccated area of Rajasthan the wind erosion has removed as much as six crores of maunds of soil per square mile in

1. A. Hamilton, "Chambal Ravine Reclamation Schemes", in *Indian Forester*, Vol. 73, No. 3, p. 99.

2. Chaturvedi, *Economic Survey of a Kotah Village*, p. 52.

certain places during the last hundred years. The hot dry winds sweeping across these deserts or semi-deserts dry out even the meagre rainfall which they receive. At Jodhpur which gets about 13% of rain the surface evaporation is about 7 1/2 per year, a terrible state in an area of scanty rainfall.¹

According to Wad there is always an encroachment of wind-borne sand on the arable lands of Rajasthan as well as a sorting out of finer particles by wind from field surfaces leaving the soil less retentive of moisture and its surface poorer in plant food.² In many instances this blown sand has been deposited in transverse valleys amongst the hill ranges and seems to encroach slowly over the entire land. Many a farmstead has been absorbed in an advancing tide of wide-blown sand. Crops in many parts of western Rajasthan are frequently damaged by sand storms. Major Erskine writes about Bikaner that "high winds often cover the sown fields with a layer of sand and that prevent the germination of the seed or by carrying away the light soil, leave the young plant exposed and cause them to wither up"³ and on grassland areas the superior grasses are frequently choked or burnt up by hot dust-laden winds, smother nearby vegetation, bury fences and block roads and railways.⁴

The conditions of the engines of the trains which come from the desert tract is well described by Webb in these words: "The engine which came through from the desert beyond was patterned, on the windward side of its long boiler-casing with clinging tawny sand".⁵

Interesting and reliable evidence of the pace of desiccations in the Punjab and Haryana has been furnished by Major W. Wright of the Survey of India. According to him the desert conditions are steadily advancing north-eastward out of Sind and Rajasthan at the rate of half a mile, destroying the fertile agricultural lands in the Punjab, Haryana, and west U. P.

In the desert fringes of the southern districts extending from Delhi to the Indus and beyond there is a belt of low rainfall where the average is from 7.5 cms. to 30 cms. Not only is the rainfall very low but is exceedingly erratic ranging from nothing at all in one year to floods in the next. In the east these conditions are found in Hissar, Gurgaon and Ferozepur districts and Bikaner in the west. Even the low and erratic rainfall of these areas adds appreciably to

1. *Indian Information*, Vol. XIV, 1943, No. 36.

2. Y. D. Wad, "Soil Erosion and its Control in Central India and in Rajputana", in *Agriculture and Livestock in India*, Vol. IX, Pt pp. 575-77.

3. Erskine, *Rajputana Gazetteer* Vol. I, p. 342.

4. R. P. Singh, "Soil Erosion in Rajputana," *Indian Journal of Agricultural Economics*, Vol. IV, No. 2, pp. 102-103.

5. A. W. T. Webb, *These Ten Years*, p. 50.

the damage initially caused by wind erosion. North of the desert fringe are to be found large expanses of unirrigated plain and slightly rolling uplands with considerably better rainfall of about 45 cms to 63 cms. In this zone the movement of sand is more localised but is still a serious handicap for agriculture. The sand is usually derived from the nearest open torrent bed where soil eroded rain-water from the neighbouring uplands has been dumped and another source is the main river channels. From both these sources the sand is whipped up by hot summer winds and carried considerable distance. According to MacLagan Gorrie, sand from the Markanda torrent bed in the plains of Ambala district has practically buried villages three kms from the east bank.

EFFECTS OF SOIL EROSION

Soil washed from the hill-slopes, fallow lands and pastures fill reservoirs and tanks; clog irrigation courses, stream channels; damage their storage capacity and reduce the life of dams constructed and river beds which result in the seasonal occurrence of floods causing tremendous damage to land, property, animal and human life. Thus, agriculture, irrigation and navigation are all affected.

The impact of soil erosion will be realised from the description that follows below.

(1) **Heavy floods in the River.** The destruction of the forests in the catchment areas of the rivers and their tributaries has caused rapid run-off and erosion leading to the deposit of an increasing mass of debris on river-beds in low lands thus increasing the damage from floods. The Ghaghra, the Kosi, the Sone and the Swarnarekha, the Ajaiya and the Damodar, the Tista, the Padma and the Brahmaputra, the Mahanadi, the Godavari, the Chambal and Yamuna, the Mahi and Sabarmati all bring floods which are in large measure due to deforestation in their upper reaches. The increasing severity and frequency of floods in recent years, in Bihar, Assam, Orissa and Bengal, U. P., Punjab, Delhi and Kashmir are due to man's invasion of the cradle of streams and trees. A great deal of soil belonging legitimately to the territories is now at the bottom of the Bay of Bengal. It is estimated that the Ganga now carries to the sea eight times the quantity of silt carried by the Mississippi, and that from catchment area only one-third the size while the Yellow river of China washes soil at the rate of 2,500 million tones per annum from the now barren upland.¹

(2) **Lowering of Sub-Soil Water Level.** As a result of torrential rainfall the water rushes violently along the drainage lines without being soaked by the soil which has resulted in lowering of sub-soil

¹ *U. P. Flood Commission Report*, "Everest has estimated that the Ganga alone annually carries one million tons of silt, which works out to 500 acre ft. of soil yearly or 1.4 million acre ft. in a day"--Quoted by D. G. Kulkarni, *People and Irrigation*, 1970, pp. 18-19.

water level so that water level of the wells has gone down causing hardships and inconveniences to the agriculturists in numberless ways. Water level has thus increased in the Hoshiarpur and Julundur districts of the Punjab and in the Etawah, Agra, Mathura and Jalaun districts of Uttar Pradesh.

(3) **Waterlogging and Decrease in the Crop Yields.** Waterlogging (specially in the command areas of irrigation projects, because of improper use of land and absence of drainage facilities) is often associated with erosion which causes a great loss to the available nitrogen and destruction of the prosperity of the sub-soil resulting in the low yield and poor quality of the produce and also reduction in the cultivated area.

(4) **Other Harmful Effects.** Soil erosion leads to abandoned regions, run down communities and wandering agriculturists. The evils that have been enumerated above are not the creation of one year or a few years but of decades, and therefore, soil erosion has been justifiably called the "Creeping Death." Its effects are not confined to the land but man suffers as well.

(5) **Destruction of Tender Vegetation.** In wind erosion the large soil particles have a cutting effect on tender plants. On grassland areas the superior grasses are frequently burnt up by the dust-laden winds. The effect of sand drifting and blowing on the inhabitants of these tracts is extremely depressing and demoralising. The tracts seriously affected by these present a desolate sight inasmuch as such soil has been blown away from the field and the scanty water supplies choked in many cases.

(6) The coastline of India extends for about 5,700 Km. and sea erosion occurs in patches in the states of Orissa, Andhra Pradesh, West Bengal, Tamilnadu, Karnataka, Maharashtra and Gujarat. But it is quite serious in the 560 Km. stretch of coastline in Kerala. Sea erosion causes permanent loss of valuable land in the densely populated states.

CONSERVATION OF SOIL

In view of the heavy losses brought about by soil erosion, effective remedies need be taken to protect these lands from further inroads of ravines. Conservation measures are needed for at least three reasons. *First*, the present soil devastation gives a serious blow to the agriculture of the area. *Secondly*, "what happened already and what is going on at an ever-increasing rate of progress is pressing upon many thousands of farmers now struggling to win subsistence from erosion enfeebled soil."² *Thirdly*, continued land devastation heavily weighs upon the future generations, and on the welfare of the country as a whole.

1. H. Glover, *Op. Cit.* p. 4

2. H. H. Bennett, *Soil Erosion—A National Menace*, 1978, p. 12.

Soil conservation measures imply using lands as it should be used i. e., treating land according to its need and using it according to its capacity.¹ According to National Planning Committee, "Soil conservation connotes all methods of soil management and other measures required to preserve soil and soil fertility from total or partial losses caused in one or the other way.² The basic aim of soil conservation is to maintain the soils at a high level to ensure sustained level of production.

Bennett says, "Soil conservation is not merely terracing, contouring, strip cropping, filling gullies or planting excessively steep or erodible land with grass and trees : it is that and whatever else needs to be done to keep the soil permanently productive or make it more productive. It means drainage if the land is too wet and irrigation if it is too dry ; and it means addition of fertilizer and organic matter if the soil is deficient in these constituents.³

Strictly speaking, soil conservation means "the *status quo ante*, i. e., the prevention of deterioration or protection from destruction rather than a positive change for the better."⁴

Schemes under soil conservation plans fall under three heads, viz, (i) bunding and terracing etc. on agricultural land ; (ii) the afforestation of ravine and badly gullied land ; and (iii) the schemes aiming at immobilizing desert lands.

It has been rightly observed that "One of the best indicators of India's soil conservation progress is the emergence of an aggressive approach to complete soil conservation planning which is based on soil treatment, fertility, bunding, rotations, modern cultural practices, the use of high quality seed, control of erosion by agronomic measures, supported by mechanical measures such as contour farming and bunding, providing adequate drainage, and most important of all, the recognition that the cultivator is the key man in the soil conservation programme."⁵

Soil Conservation Measures

Soil conservation plan generally comprises methods connected with agronomic, mechanical and land-use pattern methods.

(a) **Agronomic Methods**, deal with contour farming, crop rotation and strip farming.

1. H. H. Bennet, *Elements of Soil Conservation*, 1945.
2. N. P. C. *Report on Soil Conservation And Afforestation*, 1948, p. 27.
3. H. H. Bennett, Foreword to D. C. Kaith, etc., *A Soil Coservation and Utilization Programme for India*, 1948.
4. S. Thirumalai, *Post-War Agricultural Problems and Policies in India*, 1951, p. 61.
5. B. F. Muirheid, *Soil and Water Conservation Project Report*, U.S Technical Corporation Mission, 1959, p. 21.

Under *contour farming* are included all operations like tillage, weeding along the contour available in the field. The plough furrows help in holding light rains ; and in case of heavy rains the stems of the plant stop the flow of moving water. Contour farming reduces run-off, increase soil moisture for crop production, reduces soil losses and increases crop yields.

Rotation of crops controls erosion, reduces soil loss and preserves productivity because the productive elements that are removed by one crop are added to the soil by another crop grown in succession. An ideal rotation may consist in cultivating a raw crop, densely planted small grains and a spreading legume and grass mixture.

(b) **Mechanical Methods** are adopted to supplement the agroeconomic practices. These methods comprise contour-terracing under which a series of properly spaced ridges and drainage channels are formed along contours by construction of suitable mounds of earth.

(c) **Change in Land Use Pattern** consists in growing suitable crops in place of low yielding crops and in making best utilisation of the land by putting it to the use for which it is best fitted.

We discuss below some of the most common methods/devices adopted for conserving the soil resources.

(1) **Creation of Protective Surface.** If all the rain water were absorbed by the ground upon which it falls soil erosion would be reduced to a minimum. Maintenance of good forest cover is essential to agriculture. As John Stewart Collis wrote : "Trees hold up the mountains. They discipline the rivers. They maintain the spring. They foster the birds. Nature abhors a gully. Left to her own devices she will take care of such scars on land, providing a blanket of vegetation to bind the soil and protect it from further washing. But cultivation interferes with nature's work and prevents her from applying a poultice of vegetation to the wound. Thus only vegetation, given time, will heal these 'cancers' of the soil."

(2) **Cultivation of Soil Binding Crops.** Cultivation of such crop like peas, jowar, bajra, gram and other legumes and fodder plants like guar, clover, alfafa, berseem should be encouraged on the shifting sand while erosion-inducing and soil-depleting plants like tobacco, cotton, maize, arhar, and potato should be excluded from being cultivated on the eroded land.

(3) **Control on Grazing of animals.** Sheep and goats are more destructive than cattle. Rotational grazing, which means reserving grazing from certain parts of all the areas of land, must be introduced. By limiting grazing to one head of bovine cattle per acre and a severe limitation on the destructive goat and sheep combined with rotational opening of blocks can reduce soil erosion to a great extent. Fencing of worst affected areas may also be tried. Livestock should not be

allowed grazing during rainy season because the seed stalks are eaten before seed is formed.

(4) **Flood Control Measures.** Flood control measures include the construction of embankments, other measures of soil conservation, raising the level of the low lying villages, the construction of town protection works and dams, the establishment of a flood forecasting and warning system to inform people in time of the threat of floods.

Every small catchment of even 2 or 3 acres of hilly land may be used as a trap for water so that whatever escapes from it is guided by means of *diversion* ditches into the fields on either side of the natural drainage channel. If these small catchments are already so eroded that the water rushes down in an uncontrollable flood the use of small check dams at frequent intervals will help to reduce the forces of water. At a suitable point in the channel, where a slightly larger check dam or bund can be built, the water should be caught and led out through a masonry or spillway round the hillside in a ditch which must be properly graded to give a slight fall and ensure the passage of this water out into the fields ahead.

On the plains bunding at small distances across the sloping fields is preferable to bunding at the bottom of the fields. By creating 'bunds' along the contours the rapid flow of water is prevented and time is allowed for water to soak into the soil. Such bunding prevents the loss of fine surface soil, increases the moisture absorbing capacity of the land and consequently the yield of crops.

(5) **Bench Terracing.** Whenever there are old established settlements on hilly land, some form of bench terrace (or strip cultivation) should be evolved to check the loss of soil. The best example of complete bench terracing is seen in the hill rice cultivation, where the ruling factor is the retention of water for long periods in each field. Where a fairly broad field is wanted, stone terrace walls are essential but where a narrower field is intended, the terrace walls can be built up of turf of grassy bund which, if properly maintained, is much more absorbent than the stone wall. With good turf, banks maintained without bulges and with the ploughed land properly levelled between them, land is not likely to develop gullies because there is little run-off. Cover crops (like peas, groundnut or gram) may be grown in strips to prevent the soil being washed.

(6) **Reclamation of Ravine Lands.** In the ravine areas, reclamation may be supported by making terraces. Small channels are made on the terraces for safely carrying the run-off water downwards into big ravines. This is accomplished by placing a series of terraces across the slope, one below the other as is done in the catchment of the Machkund project in Orissa. Where the ravines are less wide they can also be terraced and used for growing horticulture crops like grafted mangoes, guavas, (depending upon the financial resources of the farmers concerned ; the extent of the area they own and pro-

ximity to towns). A part of ravine land may be converted into small tanks to meet the irrigation demands.

The control and reclamation of ravines can be achieved by construction of marginal bunds for diversion channels in the catchment feeding the ravines ; by the construction of check dams or gully plugs in the ravines at proper places ; by toning down or easing the steep slopes of the gully banks to the angle of natural repose and sodding the slopes with vines and grasses having soil binding tendencies ; by planting of suitable fast growing trees and shrubs along the bank of the river and in the cut areas which are unfit for other purposes ; by construction of wire crate wells inside the khad and by introduction of better farming practices and soil conservation measures in the table-lands of the catchment. *The initiation of dual programme of mechanical and silvicultural operations in the ravine and gully eroded lands would put a check on continued deterioration of land.*¹

(7) **Rehabilitation of Areas of Shifting Cultivation.** The rehabilitation of such areas may be attempted in one or more of these ways :

- (i) reclaiming land and providing irrigation, other inputs and services so as to encourage settled cultivation ;
- (ii) identifying areas suitable for plantation crops ;
- (iii) developing grass reserves to support animal husbandry programmes ; and
- (iv) developing areas for agricultural operations and commercial forest plantations.²

Soil Conservation Programmes in River Valleys

Catchments of the rivers, which generally lie in mountainous regions, are most vulnerable to erosion. Recent surveys indicate the actual rate of siltation in some important reservoirs thus :³

Maithan (D.V.C.)	142,870 cu. m. per year per 100 sq. km.		
Panchet (D.V.C.)	106,680	”	”
Bhakra	73,340	”	”
Tungbhadra (Mysore)	181,930	”	”
Mayurakshi (Bihar)	135,255	”	”
Matatila (U. P.)	35,290	”	”
Nizamsagar (A. P.)	49,530	”	”
Hirakud (Orissa)	37,150	”	”
Gandhisagar (M. P.)	28,575	”	”

1. Planning Commission, *Study on Survey and Reclamation of Ravines in India*, 1965, pp. 13-14.
2. *Abridged Report of the National Commission on Agriculture*, p. 215.
3. *Bhagtrath*, Vol. XVIII, April 1971, p. 63 and Ministry of Agriculture, Report of the Department of Agriculture, 1970-71, p. 52.

This silting up of reservoirs reduces the water storage capacity resulting in heavy floods downstream.

The main objective of soil conservation in river valley projects is to control soil erosion, protect land against all forms of soil deterioration, improve physical conditions of land, rebuild soil fertility, conserve soil moisture for crop use and to properly manage the cultivation practices. In fact, soil conservation aims at retaining the soil on the catchment areas for agriculture, forestry and other purposes.

The catchment areas of river valley projects run into thousands of sq. km. Neither it is physically possible nor desirable to cover all these areas with soil conservation measures. A judicious selection has, therefore, to be done for priority treatment. The results of aerial photo-interpretation completed in 13 river-valley projects have indicated that 11 to 39% or on an average 25% of the total catchment areas is problematic and needs immediate treatment. The catchment area of 21 major river valley projects (viz., Damodar Valley Corporation, Bhakra-Nangal, Beas Unit II, Hirakud, Machkund, Dantivada, Chambal, Ukai, Mahi Stage-II, Popru, Tungbhadra, Kunhat, Lower Bhawani, Ghod, Mayurakshi, Ramganga, Matatilla, Kangasbatti, Pochampad, Nizamsagar and Nagarjunsagar) which are included under the centrally sponsored programme of soil conservation is 651,540 sq. km.

The programmes are being implemented under the state, Central and centrally sponsored sectors.

Under the *state sector programme*, by the end of 1976-77, an area of 19.6 m. hectares was treated with soil conservation measures. During 1977-78, an area of 0.84 m. hectares is to be treated. The programme consists of contour bunding, bench terracing, nullah plugging, land levelling and other engineering and biological measures.

Under the *Centrally sponsored programme*, about 240 small watersheds (with 2,000 to 4,000 hectares of area) were under treatment in 30 River Valley Projects. By 1976-77, a total area of 1.16 m. hectares was treated. During 1977-78, an additional area of about 70,000 hectares is to be treated.

The *Central sector programme* conducts rapid reconnaissance surveys for identification of priority watershed in the catchments of selected river valley projects and undertakes detailed soil surveys in the problematic areas (ravine lands of Kota and Pukharayan, U. P.) and salt-affected areas of Etah. Soil and Land Use Survey is being done at Delhi, Calcutta, Nagpur, Bangalore, Ahmedabad, Hyderabad and Ranchi.

The scheme for reclamation of ravinous areas has been extended to provide protection to table lands and prevent further ingress of gullies into cultivable areas of U. P., M. P., Rajasthan and

Gujarat. During the first three years of the Fifth Plan, an area of 7277 hectares was covered at a total expenditure of Rs. 155.77 lakhs. During 1977-78, an additional area of 15,000 hectares at an outlay of Rs. 150 crores is likely to be treated.

Review of Soil and Water Conservation Programmes

Although no systematic survey has been carried out as a whole to determine the extent of soil and water conservation problem, it is estimated that of a total of 125 million hectares suffer from soil and water conservation problems out of the area of 328 million hectares of the country. The erosion inventory and conservation achievements in the country so far have been indicated as below.¹

Erosion Inventory and Conservation Achievements (In millions of hectares)

Land use	Total area (1966-67)	Conser- vation Inventory Area	Soil & Water Conser- vation Treatment completed upto 1973-74
1 Rain-fed agricultural lands	109.57	55	15.50
2 Irrigated agricultural lands	27.48	10	0.20
3 Culturable waste land and old fallows	26.45	20	...
4 Unculturable land for afforestation and grass land development	50.95	50	2.00
5 Catchment areas of River valley Projects.	70.00	10	1.02
Total	328.00	145	18.72

In the pre-Independence era, some works were undertaken mostly by Forest Departments. Hamilton and Garrie did noteworthy work in the control of *cho* problem in Shiwalik foot-hills of the Punjab. The closure to grazing by legislative measures and fencing and afforestation to the barriers, construction of check-dams, stream bank control measures formed the main element of soil erosion control programme which was more in the nature of prevention of damage.

Some works were also taken up in a few other states. The erosion control works with check dams and contour bunds were

1. N. D. Rege, B. S. Gill and S. P. Gowande, *Soil and Water Conservation Situation in India, Agricultural Situation in India, August 1974*, p. 317.

taken up in Bihar, West Bengal and some other states. Ravine control and reclamation measures were taken up in the states of U.P., Madhya Pradesh, Rajasthan and Gujarat. Successful afforestation of the ravinous area in U. P. was undertaken as far back as later part of the 19th century. But there had been no systematic country-wide effort and the programme was limited to a few States. Soil conservation like bunding and terracing have been the traditionally scarcity programmes in the world. In India, too, famine and scarcity conditions in the Deccan plateau became the prime cause of useful works of contour bunding, which were done in certain states, particularly in Maharashtra.

The systematic programme for soil and water conservation began only when organised planning was started after Independence. The programme in organised manner was taken up for the first time in the country in Damodar Valley Project when they established a Soil Conservation Department in 1949. Countrywide programme of soil conservation was taken up in the First Plan period when Central Soil Conservation Board was set up in 1953 to guide and give technical support to State organisations in matter of planning the execution of soil conservation programme. This programme, though small in comparison with the magnitude of the problems, marked the beginning of the countrywide effort for conservation and utilisation of natural resources like land and water. There were certain constraints in starting this programme on large scale in the absence of adequate basic data on soil characteristics, suitable legislation, nature and extent of erosion, trained personnel and necessary organisation at the Centre to guide the states in planning and execution of the programmes on scientific lines. Realising the importance of soil and water conservation, the Government of India set up in 1954 nine Soil Conservation, Research, Demonstration and Training Centres in different agro-climatic and soil regions of the country.

These were established at Dehradun, Chandigarh, Agra, Kota, Bellary, Ootacamund, Vasad, Hazaribagh and Chatra (Nepal). The objective was to investigate the soil and water conservation problem in different agro-climatic regions of the country and provide technical support and suitable technology for proper execution of soil and water conservation programme in the country. Simultaneously, the Ministry of Agriculture also circulated a model soil conservation legislation for enactment by various states. This was to provide legal support to undertake soil and water conservation works and execute the works with the Government funds, which could be recovered in suitable instalments.

In the *First Plan* period soil conservation measures like contour bunding and terracing and limited afforestation were executed over three thousand hectares of agricultural lands, mostly in states of Maharashtra and Tamilnadu with an expenditure of Rs. 1.6 crores. In the *Second Plan* period, 1,273 thousand hectares of agricultural and non-agricultural lands were treated with an expenditure of Rs.

20.36 crores. Besides, some works were also done for reclamation of ravine land in Madhya Pradesh and Uttar Pradesh. During *Third Five Year Plan*, an area of 6 thousand hectares was treated with an expenditure of Rs. 77.61 crores. In the three years of post-Third Plan (i.e., 1966-69) an area of 4,487 thousand hectares was treated with a total expenditure of Rs. 86.78 crores. During the *Fourth Five Year Plan*, a target of treating 6.45 million hectares of agricultural land and 0.6 million hectares of non-agricultural land with soil conservation measures was made with an outlay of Rs. 158.63 crores. However, during this plan period a total area of 7.12 million hectares of agricultural and non-agricultural land was treated at an anticipated expenditure of Rs. 160.90 crores.

The total outlay proposed for soil conservation and land reclamation for the Five Year Plan (1978-83) is Rs. 450 crores as against Rs. 221 crores for the Fifth Plan (1974-79). Land Reclamation and Development Corporations are to be established in the state to undertake programmes of reclamation of deteriorated but potentially productive land for the development postures, and where land slope permits, suitable crop cultivation, horticulture and plantations and also provide custom services like land levelling, sloping, installation of tube wells and improvement of irrigation system.

In recent years the concept of soil and water conservation has undergone a radical change. Now the programmes are being undertaken on the basis of the small watersheds with 2000 to 4000 hectares of area to secure the maximum productive and protective benefits so that all kinds of land, (i.e., agriculture, forest and pasture lands) could be treated. This programme consists of execution of integrated soil and water conservation programme, reclamation and development of lands and categorisation of inventory of soil and land resources. During the Fifth Plan emphasis has been placed on the implementation of such schemes.

According to the *Integrated Soil and Water Conservation Programmes*, emphasis is placed : (a) in *high rainfall areas* for the safe disposal of excess water so that the lands are protected against the ravages of erosion hazards by water ; (b) in *medium rainfall areas* for conserving moisture to the extent that, at least, one crop is grown successfully ; and (c) in *the arid areas* (of Rajasthan, Haryana and Gujarat) shelter belts of plantation are to be established along the roads and canals so that sand dunes are fixed.

In the integrated programme, farm ponds and silt detention tanks constructed at lower levels so that stored water could be utilised for protective irrigation or double cropping. *Secondly*, in the catchment areas of minor and medium irrigation projects, the soil and water conservation programme is to be given top priority. *Thirdly*, afforestation is to be done on the denuded forest areas.

Conclusion

Uncontrolled grazing and felling of trees, continuous cropping on the land, shifting cultivation and faulty methods of agriculture have all accentuated the soil erosion. The problem of soil erosion in general and in river valley projects in particular is acute and immense.

Therefore, emphasis need be given to soil conservation programmes. "This problem of conservation is largely one of educating the farmers so that they realise that continued exploitation of soil leads to lower incomes, the conservation in farming is economic after a certain period of exploitation has passed."¹

Four main aspects to be stressed are : (i) the provision of trained personnel for guiding the cultivators ; (ii) planning of systematic programmes for catchment and sub-catchment areas ; (iii) forward planning accompanied by advance action ; (iv) demonstrations for the great value of guarding vegetation and of other associated practice.

The water run-off can be controlled by constant cultivation and maintenance of proper field boundaries. Erosion may be checked by adopting programmes concerned with controlling the grazing of domestic animals ; bunding, contour terracing, gully plugging, and afforestation schemes.

For achieving maximum benefits of soil conservation and covering as much critical areas as feasible in a minimum possible time, we must know the pockets of silt contribution areas and amount of silt contributed by them and then have a comprehensive long-term plan to tackle these areas in order of priorities taking sub-watershed as a unit of management and ensure coordination among the various agencies incharge of implementing soil conservation scheme. Soil surveys, aerial capacity surveys and Watershed Management Plans are considered to be the tools to achieve the desired objective. Unless these basic factors are employed in scientific planning, the solution of the problem will remain a remote possibility.

1. A. G. Bunce, *Economics of Soil Conservation*, 1942, p. 49.

3.

Drought and Flood Prone Area Programmes

The Irrigation Commission, 1972, observes "Assuming that districts which receive less than 75 cm. of rainfall per annum are liable to drought, there are about 77 such districts which account for about 34% of the net area sown. Exclusive of such districts as have developed irrigation on adequate scale, there still remain 50 districts accounting for one-fourth of the uncultivated area of the country which could be considered vulnerable to drought. There are, in addition, another 22 districts in Maharashtra, Gujarat, M. P., Karnataka, Rajasthan, and U. P. accounting for 9% of the cultivated area of the country which get between 75 cm. and 85 cm. of rain. This rainfall is of doubtful efficacy and the districts have very little irrigation. They should also, therefore, be considered vulnerable. If these areas are taken into account, *as much as one-third of the cropped area in the country would appear to be susceptible to drought.* The only areas which are not vulnerable are Assam, Arunachal Pradesh, Meghalaya, Tripura, eastern Bihar, West Bengal, Orissa, west coast, and certain parts of Central India."¹ On this criterion the Irrigation Commission says "*the hardcore areas of drought comprise about 16% of the country and account for over 11% of the population*" as indicated below:²

Area And Population Subject to Drought

State	No. of Districts	No. of Tehsils/Talukas	Geographical area (000 hectares)	Population (000 persons in 1961)
Andhra Pradesh	7	60	9,700	9,416
Gujarat	11	60	7,070	5,480
Haryana	3	4	810	1,490
M. P.	9	24	4,090	3,070
Maharashtra	9	45	6,250	6,930
Karnataka	12	88	10,350	11,580
Rajasthan	9	19	7,480	2,760
Tamil Nadu	7	24	3,980	7,360
Total	67	326	49,730	48,080

1. *Report of the Irrigation Commission*, Vol. I, 1972, pp. 157 and 163.

2. *Ibid.*, p. 166.

The Commission identifies drought and chronic drought areas (on the basis of annual and south-west monsoon rainfall data from 1901-1960 for about 500 stations) as below :¹

(a) Drought area

(20% probability of rainfall departure of more than (-) 25% from the normal.

- (i) Gujarat, Rajasthan, and adjoining parts of Punjab, Haryana, West U. P. and West M. P.
- (ii) Central Maharashtra, interior Karnataka, Rayalseema, south Telangana and parts of Tamil Nadu.
- (iii) A small portion of north-west Bihar and adjoining districts of east U. P.
- (iv) A small portion of north-east Bihar and adjoining portion of west Bengal.

(b) Chronically drought areas

(40% probability of rainfall departure of more than (-) 25%

Western parts of Rajasthan and Kutch.

DROUGHT FIGHTING PROGRAMMES

These programmes comprise of adopting dry farming techniques of cultivation and conjunctive use of available water resources.

1. Technology of Dry Farming

A large part of the country depends on rains for agricultural production. It has, therefore, been felt that dry farming practice should be undertaken in such areas. According to Dr. Swaminathan, the chief features of this technology are :

(1) *To capture and retain as much of rainfall as possible.* For this, depending upon the soil type, a suitable tillage and moisture conservation technology has to be introduced. Deep ploughing in some cases and minimum cultivation in others and the sowing of *kharif* crops in ridges so that moisture for the *rabi* crops can be captured in furrows make a great difference to crop growth. Low cost water reservoirs may be constructed for water storage. The new water harvesting technology has to be introduced in graded steps, i.e. irrigation may be provided first in furrows and then techniques like sprinkler and trickle irrigation may be undertaken.

(2) *To develop a crop variety which grows quickly after sowing.* If such strains are developed, two crops can be grown in the place

1. *Ibid.*, p. 164.

of a single long-duration crop even in climatically bad years. Fortunately various new varieties—*PRS 72* and *PRS 74* of cotton (120 days) ; *Aruna* of castor (100—120 days) ; *AC 5* of Arhar (100—120 days) ; *Pusa Baisaki* of moong (50—60 days) ; hybrids *CSH 1* and *CSH 3* of jowar (100—115 days) ; hybrids *H B 1*, *H B 2*, *H B 3* and *H B 4* of bajara (80—90 days) ; *Kalyan Sona* of wheat (110—130 days) ; *C R 32—39* of rice (100 days) have been developed.

(3) *To give more nutrition to the plant.* For example, to give one tonne of grain the wheat plant requires about 25 kg. of nitrogen. Pulses and groundnuts can make their own nitrogen through biological nitrogen fixation in dry areas.

(4) *To develop new technique of fertilization.* Including foliar spraying, adoption of plant protection measures, with necessary infra-structure, demonstrations and training.

The ICAR has drawn up a co-ordinated project for dry areas which envisages establishment of 15 main centres, 3 sub-centres and one special centre in 8,000 acre tracts in 24 selected dry farming districts for research as well as for training-cum-demonstration, in order to evolve the most productive land location in specific techniques of dry farming and demonstrating their productivity and profitability to the farmers.

The strategy of dry farming is based on these elements :

- (a) Cultivation of drought tolerant and short duration varieties of crops ;
- (b) Supplemental irrigation for critical periods ;
- (c) Increasing the land and water use through double cropping with better crop planning ;
- (d) Encourage agronomical practices which lead to stabilization of crop production, e.g ; (i) proper time of sowing, (ii) adequate plant population, (iii) fertilization at economic level, (iv) use of bacterial fertilizers, (v) pasture management, (vi) wood control, and (vii) residue management.
- (e) Soil and moisture conservation practices like contour bunding, terracing, land slopping, land levelling, gully-plugging, etc.
- (f) Contingency plans to suit aberrant weather conditions like the delayed onset of the monsoons, long dry spells or early stoppage of rain.

During the Fifth Plan, till December, 1976 around 77,000 crops demonstrations were organised on an area of about 31,646 hectares.

2. Conjunctive Use of Water

The main policy for drought areas should be the conjunctive use of water from rainfall, surface and underground water to sustain an

optimal crop pattern, and to ensure a reasonable and reliable income per hectare. There exists a great scarcity of perennial rivers and, therefore, great stress need be laid on developing irrigation in these areas through smaller works like anicuts, *bandharas*, tanks and dug wells. Though percolation tanks and check-dams do not provide direct irrigation, they do contribute to firm-up and augment supplies in nearby wells and thus facilitate irrigation. Besides, although a large number of irrigation works exist in drought areas, their performance has been quite unsatisfactory due to structural deficiencies, lack or inadequacy of storage, loss of water due to seepage from unlined canals, distributories and field channels, and wasteful use of water through traditional irrigation practices. These all require early improvements. Water losses may be minimised by lining of water courses. Like Israel, in drought areas drip or trickle irrigation may be employed to reclaim some highly saline desert areas to develop them for growing high value, off-season crops.

In the drought areas, a large number of new irrigation works have been suggested by the state Governments, important among them (26) are likely to benefit more than 40,090 hectares each. The districts to be benefitted from these are Mahboobnagar and Kurnool in Andhra Pradesh, Khargaon in M. P., Chitaldurg, Gulbarga, Raichur, Bellary and Bijapur in Karnataka, Poona, Ahmednagar, Sangli, Satara and Sholapur in Maharashtra; Gurgaon and Mohindergarh in Haryana and Banswara in Rajasthan.

During the Fifth Plan, irrigation schemes costing Rs. 132.11, crores have been approved. These include construction of wells tubewells, tanks, lining of channels, lift irrigation schemes etc. Till December, 1977, 412 tubewells, 1,794 tanks, and 9,256 dug wells were completed and 3,153 pumpsets installed. As a result of all this irrigation potential of about 1.28 lakh hectares has been created. 24 medium irrigation schemes, with an irrigation potential of 5,696 hectares have been sanctioned at a cost of Rs. 33.81 crores during 1977-78.

The drought prone areas represent nearly 19 per cent of the total area of the country and account for nearly 12 per cent of the population. Such areas have been classified under four regions; *arid* (less than 375 m.m. rainfall), *semi-arid* (375 to 750 m.m. rainfall); *dry sub-humid* (750 to 1125 m.m. rainfall); and *sub-humid region* (rainfall above 1125 m.m.).

In these regions, the cropping pattern of different districts indicates that districts falling under the arid region grow only one or a few crops; while district in the semi-arid region have more diversified crop composition. In the dry sub-humid region, the crop husbandry is still more diverse. In the humid areas the cropping pattern is fairly skewed.

The important crops of the D P A P districts are rice, bajra, jowar, ragi, maize, wheat, gram, groundnut and cotton. The districts important for different crops are :¹

<i>Crop</i>	<i>No of Districts having about 5% of the cropped area</i>	<i>Share in the total National production</i>
1. Rice	30	12%
2. Bajra	33	1/4 to 1/3
3. Jowar	31	1/4 to 1/3
4. Maize	9	1/10
5. Ragi	8	1/6
6. Wheat	23	...
7. Gram	30	1/5
8. Groundnut	22	1/4 to 1/3
9. Cotton	13	1/8

The Drought Prone Area Programme

The D. P. A. P. was initially stated during the fourth plan period, in 1970-71. The drought prone areas were selected on the basis of such criteria as low extent of irrigated areas, low and/or erratic distribution of rainfall and high periodicity of drought. The basis objectives of the programme are :

- (i) to mitigate over a period of time the impact of the severity of drought.
- (ii) to optimise the utilization of all resources in the areas with primary emphasis on land, water, livestock, and human resources : and
- (iii) to improve the living conditions of the rural poor who suffer most in times of scarcity and drought.

During the Fifth Plan period, Rs. 181.50 crores have been allotted for D. P. A. P. of this minor irrigation scheme will account for 60%, rural communication for about 25% and balance for soil conservation, afforestation and drinking water supply.

Under the Fifth Plan, the development strategy will try to (i) remove regional imbalances in the country by improving over-all productivity, which has been low ; (ii) stop the migration, every third year, of about 3 million inhabitants of the arid zone ; and (iii) reduce the strain on financial resources of the country.

1. D. Arora and D. S. Mehra, "Productivity Levels of Major Crops in Drought Prone Areas Programme District," *Agricultural Situation in India*, Vol. XXIX No. 5, August, 1974, p. 195.

The main plank is to restore a proper ecological balance in the drought prone areas, through :

(a) **Development and management of irrigation resources**, with this about 19% of the drought-affected areas are to be provided with irrigation facilities, as against 12% at present. Besides, the limited water available is to be put to optimum use, through avoiding of crops such as sugarcane and paddy and encouraging of food crops and pasturage.

(b) **Soil and Moisture Conservation and Afforestation Programmes**, under which soil conservation measures such as contour bunding, furrowing, terracing and levelling, and establishing shelter belts, road-side and canal bank plantation, creation of wind-breaks, wood-lots on community lands and pasture development are being undertaken. Upto Dec., 1977, afforestation was undertaken on 1.16 lakh hectares farm forestry over 14,487 hectares and extension forestry over 3,605 hectare kms and 949 kms. An area of 65,227 hectare was brought under improved pastures.

(c) **Re-structuring of cropping pattern and pasture development**, through ensuring the optimum use of soil moisture by choosing crops which have a deep root system and have the capacity for quickly establishing roots in deeper layers of the soil. Crops like sunflower and castor are planted, and grassland provided for stabilising production on dryland. Millets and green gram are also cultivated, which give better performance under moisture stress conditions. Inter-cropping is undertaken so that along with grasses, annual rainy season legumes can be cultivated.

(d) **Livestock development**, with the arrangements for producing feed and fodder, augmentation of milk production is aimed at through breeding ; and sheep farming is undertaken on a large scale. This programme includes cross-breeding, supply of milch cattle, opening of chilling centres and dairy plants, establishment of intensive cattle development projects.

(e) **Development of India and marginal farmers**, for whom D.P.A.P. will be undertaken for about 5 million small and marginal farmers and 3.5 million agricultural labourers. Till December-1977, 13.65 lakh farmers have been benefited.

FLOODS

India is traversed by a large number of big and small river systems, many of which overflow in certain seasons but during other times they dwindle to mere trickles. On account of high rains as well as wide variation in its intensity and the unequal aerial distribution a number of rivers swell up in high floods during this period. The rivers of north and central India are prone to frequent floods during the south west monsoon season. The Brahmaputra river system can have severe floods even in late May or early June. Floods in the river Godavari are less frequent and generally occur during later part of the monsoon period.

Narmada experiences flash floods with a rise of as much as 3 to 4 metres per hour. During the post-monsoon season, although the frequency occurrence of floods in north-east and central India is much less than that during August-September, they are generally very devastating due to the severity of the weather systems responsible for them and the antecedent soil moisture conditions. The coastal belt of India often get flooded in association with the movement of pre-and post-monsoon cyclonic storms forming in the Bay of Bengal. Such floods generally occur in May, October and November. The proneness of various parts of the country to floods is mainly due to heavy rainfall over those areas in association with tropical lows, depressions, cyclones and storm surges.

Intensity of Floods

Almost all the rivers in India cause flood in their one or more reaches. Generally the lower reaches are severely affected by flood due to great depth and longer duration of inundation. The following table indicates the enormity of the flood problem in India :

Enormity of Flood Problem¹

Sl. No.	Name of river	Catchment area in sq km (Approx.)	Peak floods in cumec (Approx.)
(1)	Ganga river	10,73,070	73,000
	Tributaries of Ganga :		
	(i) Yamuna	3,75,886	37,000
	(ii) Ghaghra	1,27,950	28,200
	(iii) Gandak	46,300	19,800
	(iv) Burhi Gandak	12,500	2,800
	(v) Kosi	86,900	22,600
	(vi) Sone	71,259	36,818
	(vii) Baghmata	6,320	4,130
	(viii) Kamla	2,980	2,520
	(ix) Punpun	8,530	641
	(x) Mahananda	20,600	44,000
	(xi) Damodar	25,820	18,410
(2)	Brahmaputra	924,000	74,000
(3)	Teesta	15,630	18,700
(4)	Barak	25,900	15,122
(5)	Godavari	3,12,812	88,000
(6)	Narmada	98,796	70,580
(7)	Tapi	65,145	25,400
(8)	Mahanadi	1,41,589	44,724
(9)	Brahmani	15,810	18,300
(10)	Baitarni	11,050	19,700
(11)	Vamsadhara	10,650	6,800

1. *Bhagtrath*, Vol. XXIV No. 4, October, 1947, p 151.

Magnitude of Floods

Statistics of damage from 1953 to 1977 show that average direct discharge of floods, heavy rainfall and cyclones is of the order of Rs. 247 crores a year. The maximum damage during this period was of the order of Rs. 1,118 crores in 1977 as against Rs. 631 crores in 1974. Of the total damages, damage to crops is about 80% and damage to houses and public utilities about 20%. The average area affected by floods per year is of the order of 14 lakh hectares of which cropped area is about 31 lakh hectares. On an average, 16 million people are affected by floods every year. The average loss of cattle has been of the order of 55,031 and that of the houses damaged 0.8 million.

Severe floods have occurred, for the last 5 years in Assam, Andhra Pradesh, Rajasthan, U.P., Bihar, Orissa and to some extent in Gujarat and Maharashtra also. Studies have shown that in the past few years nearly 60% of the flood damage in the country occurred in the regions concerned by the Himalayan rivers. The damage due to cyclones and heavy rainfall was as much as 40% of the total. In the peninsular region, most of the damage was due to cyclones whereas in the Himalayan region 65% was accounted for by the floods and about 35% by heavy rains. In the central Indian region, the damage was the least and was mostly due to floods in the rivers.

Causes of Floods

India has the worst distinction of being one of the tropical countries severely affected by floods. This is most pronounced in the northern States and some of the eastern States, such as U.P., Punjab, Bihar, Assam, Orissa and West Bengal. In these areas floods are caused by seven factors :—

- (i) Heavy precipitation in the head reaches of the rivers, and not by rainfall in the plains, causing heavy flow in the rivers.
- (ii) Insufficient waterways available for rivers. Due to various factors rivers get choked and are unable to pass down the flow fast enough. This is particularly true of Jhelum.
- (iii) Indiscriminate deforestation in the catchments and the upper reaches of the river basins, especially in the Siwalik hills, Assam and Himalaya etc.
- (iv) Man's encroachment of river domain as is found all along the Yamuna, and the Chambal.
- (v) Spilling of river over natural banks.
- (vi) Cyclones accompanied by winds and rainfall in the coastal regions, particularly Andhra Pradesh and Tamil Nadu.
- (vii) Inadequate drainage arrangements in some areas.

According to the Draft Fifth Five Year Plan, "the progressive increase in the damage due to floods can be attributed to several reasons : (a) the mounting pressure on land from ever increasing population which induce people to occupy, build, and cultivate on traditional ponds, depressions, and *khadir lands* ; (b) the role played by the development works such as roads, railways, canals, etc. *firstly* by exposing more public property to damage and *secondly* by accelerating damaging capability of waters by transforming sheet flows into concentrated flows through culverts, siphons, bridges and aqueducts etc. The flood control measures have, therefore, to keep pace with the general tempo of economic and other developmental activities."

Flood Zones

Broadly speaking, India can be divided into four flood zones :

- (a) The eastern zone, stretching to the east of the Ghagra to Dibrugarh and beyond, is the worst affected. The eastern part of U. P., north Bihar, north Bengal, Manipur, Arunachal Pradesh, and Assam constitute this zone. The rivers of this area come down from the Himalaya and carry large volumes of water, heavy silt, and inundate vast low-lying and flat areas.
- (b) The northern zone, comprising of Jammu and Kashmir, H.P., Haryana, Punjab and western U.P., has shorter rivers and do not have the habit of changing courses and the water is also not excessive. However, the Jhelum and the *Chos* of Punjab pose some difficult problems. They carry more sediment than water and there are no proper outlets for their waters.
- (c) The southern zone, comprising of the peninsular India, has rivers which do not carry much sediment and run the same course as they did for several centuries. Excessive floods do not occur annually but only at long intervals. However, when they do occur, they often exceed those in other regions and cause losses of crops by inundating the deltas. In the coastal rivers, north of the Godavari, there is excess sediment, causing change of course to some extent.
- (d) The Orissa zone. which has good-sized rivers like the Mahanadi and the Brahmini, which bring down large volumes of water, but do not find ready outlets, as their mouths have contracted as much as 40%. Gradually, due to confining embankments, the beds of rivers have risen so that rivers run on ridges instead of valleys.

The total area that can reasonably be protected from flood damage has been assessed to be about 16 million hectares out of a total area of about 25 million hectares liable to floods.¹

National Flood Control Policy

Floods are a recurring calamity. It is only during the last 100 years that the problem of flood control has been engaging the attention of the Government. The National Flood Control Policy was announced in 1954. It has three phases :

- (i) *Immediate phase*, extending over a period of 2 years, comprise collection of basic hydrological data, construction of embankments, urgent spurs, rivetments, improvements to river channels and raising of villages above flood level.
- (ii) *Short-term phase*, covering next 4 to 5 years, consist of improvement of surface drainage, establishment of proper flood warning systems, shifting or raising of villages above flood level, construction of building channel diversions, more embankments and construction of raised platforms to be used during times of flood emergency.
- (iii) *Long-term phase*, which envisages schemes such as construction of dams or storage reservoirs for flood protection and soil conservation in the catchments of various rivers, detention basins and digging larger channel diversions.

The first two phases were carried on during the First and the Second Plans and the last one during the Third Plan.

Progress of Flood Control Work

Since then a large number of flood control and drainage works have been carried out in vulnerable areas. These include construction of new embankments and dams, river training works, town protection works, raising of village above average flood level, drainage improvements and the like.

Since the commencement of the National Flood Control Programme in 1954, 15,540 km. of embankments, 17,850 km. of drainage channels, 250 town protection schemes and raising of 4,700 villages above high flood level had been completed by March 1977. This programme has cost Rs. 536 crores and benefitted an area of 9.5 million hectares.¹

The amount spent on flood control programmes has varied between Rs. 14 crores during the First Plan to Rs. 48 crores in the Second Plan and Rs. 82 crores in the Third Plan. The programme is to be accelerated during the Fifth Plan for which an outlay of Rs. 301 crores was put as against Rs. 162 crores in the Fourth Plan. The actual expenditure on the flood control works, upto the end of

1. *Ibid.*, p. 113.

the Fourth Plan was Rs. 347 crores. The expenditure during 1974-77 was of the order of Rs. 186 crores and that of Rs. 100 crores during 1977-78.

During the Fifth Plan, priority was accorded to the raising and strengthening of existing embankments and other connected flood protection works, *Secondly*, provision shall also be made for undertaking surveys, investigations and studies for the preparation of both the comprehensive outline plans for flood control in the different basins and the detailed individual schemes for inclusion in the Plan. *Thirdly*, measures for drainage and anti-water logging, mainly in the states of Punjab and Haryana and to some extent in U.P. and deltaic tracts of Andhra Pradesh and Tamil Nadu where old irrigation schemes have been in operation for a very long time, were taken in hand.

Progress of Flood Control in India

	Pre-Plan	First Plan	Second Plan	Third Plan	Three Annual Plans (1966-69)	Fourth Plan	upto the end of March, 1977
1. Length of embankments constructed (Km)	5,280	7,274	10,122	12,152	12,231	14,406	15,540
2. Length of drainage channels (Km.)	—	—	—	8,675	7,172	15,412	17,850
3. Towns protected	—	20	80	164	178	217	250
4. Villages raised above high flood level	—	1,200	4,300	4,582	4,582	4,683	4,700

Task Ahead

The characteristics of the flood zones in India are the excess water, excess silt and inundation of the vast low-lying and flat areas. Therefore, no single measure can be suggested for effective control of floods. Each river has to be tackled in its own way.

Since sediment is a major contributing factor to the problem of floods and erosion, measures of control of erosion in the upper catchment of such rivers is a "must". It can be prevented by adopting effective drainage and afforestation of the mountain slopes.

The floods caused in the rivers of Central India can be effectively minimised by construction of detention or storage reservoirs.

The spilling of the peninsular rivers can be overcome by constructing embankments.

The soundest approach lies in a calculated combination of flood control structures, flood zoning and a reliable system of flood forecasting.

It need hardly be emphasised that rivers uncontrolled are greatest engines of destruction, but controlled they are the greatest benefactors of mankind.

The Central Government provides assistance to the states as against natural calamities, in the shape of loans and grants. The following tables give the relevant data.

Central Assistance as Relief against Natural Calamities

Year	Loan (Rs. in 000)	Grant	Total
1966-67	5,735.89	2,465.00	8,200.89
1967-68	6,000.00	1,550.00	7,550.00
1968-69	9,350.00	1,200.00	10,550.00
1969-70	9,998.00	2,460.00	12,438.00

Calamity-wise Assistance (Rs. in crores)

Year	Drought	Floods	Cyclone	Earth quake	Total
1966-67	75.25	3.90	2.86	—	82.01
1967-68	66.61	2.30	2.50	4.09	75.50
1968-69	77.95	16.50	6.05	5.00	105.50
1969-70	88.58	20.00	16.00	—	124.58

The rising trends in expenditure from Rs. 151.87 crores in 1969-70 to Rs. 318 crores in 1972-73, caused a great anxiety in the Government. Central assistance to the states for financing such expenditure also registered an equally disturbing increase from Rs. 8.65 crores in 1965-66 to Rs. 216.67 crores in 1972-73. In view of this increasing expenditure, the Sixth Finance Commission recommended that instead of incurring large-scale expenditure on relief on an *ad hoc* basis of schemes of dubious value, provision ought to be made on a much larger scale for development of drought and flood prone areas in the Fifth Plan. Consequently, the old pattern of Central aid to calamity hit states was discontinued since 1974-75. But in the light of the unprecedented floods in the last three years the question has cropped up again. States have to manage the large burden without impairing the development programmes. During 1977-78, special loan assistance of Rs. 3 crores was sanctioned to Orissa and Rs. 7.75 crores to Assam for flood control measures.

Forecasting of Floods

Though flood control measures are being carried out for reducing the losses caused by floods, it is not possible to provide protection at all places and against all magnitudes of floods. Moreover, flood control measures involve considerable time and energy. Damages done to property and human and cattle lives can be reduced

to a considerable extent by forecasting floods. Flood forecasting services give advance warning to the engineering authorities for keeping desired vigil and safeguarding various structures. Hence, in 1959 a flood forecasting centre was set up at Delhi. After 10 years, 6 more centres were set up at Gauhati (for Brahmaputra and Barak basin), Jalpaiguri (for Teesta river basin), Patna (for Ganga and its tributaries in Behar), Lucknow (for Ganga and its tributaries in U.P.) Bhubaneswar (for Subaranrekha, Burha Balang, Brahmani and Baitarni in Orissa), and Surat (for Narbada and Tapti rivers). Flood forecasting work in almost all the major and interstate river basins have been covered under the Flood Forecasting Programme.

The system of flood forecasting consists of four phases, viz.,

- (i) *observation and allocation of operational data*. This is done by the Central Water Commission and the Indian Meteorological Department ;
- (ii) *transmission of data* by these bodies to the Flood Forecasting centres ;
- (iii) *formulation of forecasts* on the basis of rainfall in the catchment areas ; and
- (iv) *issue of forecasts*. On an average, 4,000 forecasts at various places are issued during the monsoon season every year.

Flood Control Bodies

At the national level, there is a Central Flood Control Board which coordinates the work of State Flood Control Boards and the River Commission (flood). The Central Government have constituted the Brahmaputra Flood Control Board and the North Bengal Flood Control Board for laying down the policies : approving schemes and fixing priorities. The Ganga Flood Control Board has been set up for preparing a comprehensive flood control plan for the Ganga basin.

The National Commission on Floods has been estimated by the Central Government with a view to go into the problems of flood and recommend flood control measures.

4.

Forest Resources and Forestry Development

Forests in the Historical Past

There was a time—a millennium or so back—when the broad picture of India was that of a sea of forests with scattered islands of cultivation. The economic and cultural life of the country centred largely around forests and rivers and both were held to be sacred. *Rigveda* (the oldest religious book of the Hindus) has a striking hymn to the Goddess of Forests. *Manusamhita* (the ancient Hindu Law Code), regards the destruction of trees as a serious offence and prescribes a heavy penalty for it. *Agani Puran* (another Hindu scripture) goes so far as to say that a man who plants trees for the welfare of the public obtains absolute bliss. Many famous events in the history of Indian civilisation are associated with forests. *Mahabharata*, the great epic, was written in the sacred groves of *Naimisharanya*. “The culture of India gathered strength in the *Tapovan*s all over the country where the sages lived and men of affairs spent their retired life. The race memory of the Hindus is intertwined with the beauties of *Nandanvana*, with dramatic events in *Dandakaranya*, with the tragic atmosphere of *Ashokavana*. And the story of Krishna is inseparable from that of *Brindavana*. But all these places and many others which are still called *aranya* or *vana* (forest) are no longer forests in reality.”¹

A great number of forests survived in all parts of India, including the plains throughout ancient times,² and for that matter, into the period (A.D. 399-414) when the Chinese traveller Fa-hsien recorded great empty tracts desolate and barren in Kapilvastu, the kingdom in which Buddha had been born.³ Moreland has shown that in the comparatively recent period of Akbar (1556-1605), there was much more forest than survived at the time in 1920 : for instance, the Tarai forests came as far south as the line joining Barilly, Gorakhpur and Muzaffarpur where was also forest in the

1. *The National Forest Policy of India*, 1952, pp. 17-18.

2. B. C. Law, *Historical Geography of Ancient India*, 1954, pp 40-42.

3. H. A. Giles, *Record of the Buddhist Kingdoms*, (re-translated), 1936,

Allahabad Jaunpur area. Though the Upper Ganga Plain seems to have been heavily cultivated, it still contained jungles and hunting grounds.¹

In the anarchy of A.D. 650-950, Magadh had declined and the jungle extended from the Himalaya to the neighbourhood of Thanesar.² Again, when Assam was taken by the British from the Burmese in 1826, it was largely in forest. According to Lees, "Just before the early 1860's, it was covered by 'impenetrable jungle and rank vegetation' subject to deadly and noxious miasma and malaria generated thereby."³

Irfan Habib has said, "The cultivated expanse of the Great Plains, the valleys and hill-slopes of India has been created in course of a stubborn struggle against Nature, which the Indian peasant has carried on for thousands of years. Forests and wastes have retreated, recovered and again retreated, in endless cycles, before his hoe and plough. Every period in Indian history has had, therefore, its 'forest line' and 'desert frontier' besides its political and military boundaries."⁴

Most of the forest lands were laid bare, where colonization was attempted and where towns and villages grew. In some cases, deforestation had gone to such an extent that hardly it could be recognised that once it was deeply forested.

Destruction of Forest Lands

Various forces brought about a decrease in forest area.

(a) **Encroachment on Land for Agriculture.** As the pressure of population increased it was natural that agriculture should encroach more and more on the forests. The life which centred around forests soon became centred around agriculture. It was, however, after the Muslim invasion of the country that the clearance of forests began to assume serious proportions. While the old Hindu tradition held forests to be sacred and discouraged cutting down of trees, the new invaders did not have the same religious or sentimental scruples against destroying them, although they were fond of gardens and orchards and planted many noble avenues around their seats of government. They pursued a deliberate policy of encouraging agriculture at the expense of forests because the former yielded more revenue. And once the restraining influence of the State was removed, the increasing pressure of population accelerated the progress of deforestation in the country. Occasionally, of course, villages relapsed into jungles when they were depop-

1. W. H. Moreland, *India at the Death of Akbar*, 1920, pp. 7-22.

2. *Imperial Gazetteer of India, The Indian Empire*, Vol. 2 1909, p. 300.

3. Lee quoted by B. H. Farmer, *Agricultural Colonization in India Since Independence*, 1974, p. 13.

4. Irfan Habib, *The Agrarian System of Mughal India, (1556-1707)*, 1963,

ulated by war, famine or disease. But by and large forests fought a losing battle throughout the centuries against encroaching agriculture.

(b) **Need for Railway Sleepers and Other Purposes.** With the advent of the British, an unprecedented attack on forests began in search of railway sleepers, timber for naval stores and military requirements, and wood and timber for domestic and industrial purposes (needed by the rising population). The fellings became excessive and a fierce onslaught on forest areas was made by the middle of the 19th century so that a large part of the forest area was depleted. Irresponsible cutting generally took the form of wanton destruction of forest by simply stripping it or by failing to adjust cutting practices to the life cycles of the trees.

(c) **Heavy Grazing by Cattle.** Forests have also been heavily grazed, ruthlessly lopped and made use of in other ways resulting in the disappearance of the forests and the devastation of the pasture. The incidence of heavy grazing has led to severe encroachment on forest area. This incidence varies from 1.25 acre to about 2.50 acres. The grazing animals damage young shoots of trees, destroy the water absorbing litter of the forest cover by their hoofs and disturb the soil.

(d) **Damage Due to Insect-pests.** Forests have also been attacked by a number of insects (weevil, bark beetles, moths, borers, etc) which feed on seedlings, the roots and trunks of the trees. The larvae of numerous moths attack the leaves and buds of many trees. Scale insects sap up twigs and branches, borers injure trunk and branches. Many a time forest fires, that spread wildly for man's folly, destroy forest growth but also make surviving trees vulnerable to disease.

As a result of these factors, forests in the Indo-Gangetic plains succumbed to the relentless pressure of population and man's folly and receded to the inaccessible tracts whose topography made cultivation difficult and where adverse climatic conditions rendered habitation, if not difficult, at least impossible. The process went on unchecked until forests shrank to their present dimensions.

The total area under forests formed 22.48 per cent of the total geographical area in 1950-51, and this percentage further fell to 21.10 per cent in 1960-61 and to 20.4 per cent in 1966-67 but it increased to 22.7 percent in 1971-72 as a result of afforestation plans. In 1972-73, the proportion again declined to 20.4 per cent. This decline may be attributed to a number of factors, such as, the submergence of large areas of forests in river valley projects ; settlement of landless agriculturists, unauthorised clearance and occupation of woodlands: exercise of ruinous rights by tribals and others living in areas adjacent to forests : practice of shifting cultivation and excessive grazing

terai areas : expansion of area under plantation crops (like tea and coffee) and to more limited extent crops like rubber and cardamom, which has resulted in a process of deforestation. (Refer to Appendix 1 at the end of the chapter for area lost for various purposes).

Area Under Forests in India (000 hectares)¹

Year	Forest Area	% of the Total Reporting Area
1950-51	40,482	14.2
1955-56	51,343	17.6
1960-61	54,052	18.1
1965-66	61,543	20.2
1966-67	63,480	19.2
1967-68	62,650	19.2
1968-69	64,580	19.8
1969-70	66,038	21.6
1970-71	65,862	21.6
1971-72	65,708	22.7
1972-73	65,405	20.4
1973-74	65,700	21.2
1974-75	65,600	21.2

TYPES OF NATURAL VEGETATION

The wide variations that obtain in the physical features, soil and climate of India give rise to a large variety of natural vegetation, tropical, sub-tropical, temperate as well as alpine type—in crop lands as well as in forests. Areas at a height of 3,750 metres and over above sea level contain alpine vegetation. Below that, at heights of from 2,000 to 3,500 metres temperate vegetation with deciduous and coniferous trees is most common. In the lower parts of the hills and in the plains, tropical vegetation is found, which is by far the most common in the country though it differs widely from place to place according to relief and humidity. West of the great band of the Ganga at Rajmahal, the indigenous vegetation is that of a dry country. In the extreme west, such trees as exist are leafless during the dry season. Towards the east, where the rainfall is heavy, the vegetation is on the contrary luxuriant with evergreen plants and trees. That is also true of coastal belts of the south. On the loftier parts of the Deccan plateau, where rainfall is low, only small trees and grasses grow. In the centre of the country, monsoon forests generally exist except in the drier parts where grasses constitute the main vegetation.

Thus, two important facts about natural vegetation in India may be noted. *One*, due to a greater variety of physiographic and climatic conditions, an equally varied vegetation is found, contrasting as they do on the one hand the tropical monsoon forests with the alpine meadows of the Himalaya, and on the other, the xerophytic desert vegetation and the marshy Sunderbans. *Second*, it is strange that not one of the families of the flowering plants is peculiar to India and we have the remarkable result that its flora is no more than a mere aggregation of several floral types. Likewise, although Tibetan and Siberian types (alpine herbs and shrubs) reach India in the Alpine regions of the Himalaya yet it is the Chinese and Japanese varieties (oaks and rhododendrons) that are typical of the temperate regions and although lime, the beech and the chestnut extend from Europe to the Far East, yet they seem to avoid even the temperate belt of the Himalayas, for reasons unknown. Malayasia element is the dominant type in India. African element comes next.

There are only four types that characterise the landscape over wide areas, the rhododendrous belt in the Himalaya ; the pines of west: the bamboos of south India and the xerophytic types in the Rajasthan desert. But in much smaller isolated stands are found the palms, coconuts and arecanuts in the South, the acacias fairly wide spread, the storbilanthes in the Nilgiris, the Dipterocarpus in eastern Assam, and sal at the base of the eastern Himalaya. These are best conspicuous features of the landscape, but they cannot by any means be considered dominant.

From the slopes of the Himalaya to Cape Comorin, and from the dry tracts of Rajasthan to the eastern limits of the Assam hills, there is an infinite variety of forest type. The main types of forests found are:

(i) *Evergreen forests* occur where rainfall is adequate (over 200 cms.) and its distribution satisfactory. They consist of lofty, dense and evergreen trees with numerous epiphytic ferns, mosses, orchids and aroids. These forests are found throughout the Western Ghats from Bombay southwards to north and south Kanara, covering parts of Tamilnadu, Karnataka, Kerala and the Andaman and Nicobar Islands. In the northeast India they occur in sub-montane divisions of north Bengal, the coastal strips of Orissa, Assam, Arunachal Pradesh, Tripura, Manipur, Nagaland, and Meghalaya. The trees of economic importance are ivory, palm, bamboo, rosewood, ironwood, mahogany, sardalwood, ebony, ferns *Vateria Indica*, *Hopoea parviflora*, and *xylia xylocarpa*, etc.

(ii) *Deciduous forests* occur in areas with less copious rainfall (100 to 200 cms.) mahua hurra. They contain teak, sal, rosewood, pine, bamboo, redwood, anjan, garjan, paduk, termilias, mulberry, sisu,

of M. P., Maharashtra and Tamilnadu and in drier parts of Kerala and the western portions of Karnatak. In north, this type is distributed practically throughout northern India especially in U. P., Bihar, Orissa, West Bengal and Assam.

(iii) *Dry Forests* are found in areas where rainfall is still less (50 to 100 cms). Here the vegetation becomes sparse and consists of *shorea robusta*, *acacia catechu*, *kikar*, *acacias*, *Arabica*, *prosopis*, *tamarix albizzias*, date palm, Ber, *pipal*, and other thorny bushes. This type occurs in Central India throughout the dry region of the Indian peninsula, to the lee of the Western Ghats, from the extreme south up to Indore and Bhopal, being prominent in Tamil Nadu, Andhra Pradesh and Maharashtra, Gujrat, and in the south west Punjab and Haryana, Rajasthan and portions of West U. P.

(iv) *The Montane Forests*. The Himalaya have a zoning of their own running from roughly west to east in a semi-circle, the zoning depending mainly on altitude, though rainfall plays an important part as one proceeds east. At the foot of the hills up to 500 metres we find tropical forests known as *Tarai* forests containing bamboos, tree-ferns, palms and bananas. From 500 to 1340 metres there is a belt of the sub-tropical forests of which the sal is the typical tree. From 1340 to 2600 metres we pass through the temperate forests of chir, low-level oaks, rhododendrons, magnolias and laurels, etc. From 2,600 to 3,000 metres we pass through the sub-alpine zone of which deodar, spruce and Himalayan or blue pine are typical. From 3,000 metres higher there is the Alpine zone containing the Kharsu oak, silver fir and birches.

(v) *The Beach Forests* extend all along the coast where a sandy beach occurs. Strong salt-laden winds render the habitat xerophytic. At other places, small evergreen and deciduous trees and numerous shrubs occur. Where open, the maritime grass and other surface creepers which bind the sand are conspicuous.

(vi) *Tidal or littoral forests* are found on the ground near the sea coast which is flooded with slightly brackish water at high tide. Such forests occur at the mouths of Mahanadi, Krishna, Godawari and in the Ganges and Brahmaputra deltas. The forest is closed ever green having species like, *palm*, *nipa hertigra*, *Rhizophora cerlops* cane serew pines, palms gordan, bogla, sundari, etc.

(vii) *Fresh water swamp forests* occur above the salt water limit on wet alluvium at the head of big deltas of rivers in parts of Assam, West Bengal, U. P. and Tamilnadu. The forest is rather an open crop of evergreen trees containing *Kadam*, *Pandanus*, etc.

Classification of Forests

Indian forests have been classified on the basis of type, legal status, composition, and ownership.¹

Out of a total forest area of 749 lakh hectares, from the point of view of exploitation, 56% is exploitable, 21% is potentially exploitable and the rest is inaccessible.

From the "legal status points of view," about 48 per cent forests are *reserved* (353 lakh hectares) 32 per cent *protected* 242 lakh hectares and 20 per cent unclassified (113 lakh hectares).

By "Composition", 7 per cent is temperate forests—comprising coniferous 3 per cent and broad leaved 4 per cent and remaining 93 per cent is tropical forests, 80 per cent deciduous, 12 per cent evergreen and 1 per cent others.

By "ownership" about 91 per cent is under the state forest departments and the rest under corporate bodies and private individuals.

Appendix 2

Regional Distribution of Forests

Although there is a wide variety of vegetation which is reflected in forests, yet the proportion of the forest area is rather low compared to most of the countries of the world. India's forests cover 749,399 sq. km. (or 67 m. hectares), *i.e.*, about 20.4 per cent of the total geographical area as against the world's average of 29.5 per cent. The percent of forest areas varies from 28.1 in West Germany to 32.8 in U.S.A.; 33.9 in U. S. S. R.; 61.8 in Japan, 56.7 in Brazil, 63.5 in Indonesia, 70.9 in Finland and 77.2 in Thailand² From these data it can be rightly concluded that India is very backward in this respect. The minimum area of forests that has been regarded necessary is from 25 to 33 per cent of the total area, but India possesses only 20 per cent

Not only is the forest area proportionately smaller in India but it is also unevenly distributed. Most of the forests are concentrated in a few states viz ; Andhra Pradesh, Assam, Madhya Pradesh, Karnataka, Himachal Pradesh, J. & K., Kerala, Orissa, Meghalaya, Nagaland, Manipur, Tripura and Andaman, Nicobar Islands etc. The forest area varies from 3.4 per cent of the reported area in Rajasthan, to 12.5 per cent in Bengal. 1.5 per cent in Punjab, 22.3 per cent in Andhra Pradesh, 14.3 per cent in Karnataka, 16.7 per cent in Bihar, 17.6 per cent in Maharashtra, 16 per cent in Tamilnadu, 29.3 per cent in Assam, 33 per cent in M. P., 27 per cent in Kerala, 77 per cent in Andamans and 60 per cent in Tripura. In Northern India, the proportion of forest lands to the total area is much lower

1. *India, 1977-78*, p. 223.

2. *Third Five Year Plan*, 1961, p. 186.

than the all-India average. Three facts should be noted about this distribution. *First*, the conspicuous states which have a very low percentage of forest and where intensification of afforestation programmes are urgently needed are Bihar, Gujarat, Rajasthan, Haryana, Punjab, U. P., and West Bengal. *Second*, in most states forests are situated on mountains (as in Jammu and Kashmir and in Himachal Pradesh) while plains are devoid of these, with the result that the problem of soil erosion has been aggravated. *Third*, even 20 per cent of the area under forest is not fully covered with true growth. Actual coverage under forests is about 17 per cent and 3 per cent is forest in name only.

The per capita forest area works out at only 0.2 hectare in India as against 8.6 in Brazil, 5.1 in Australia, 3.5 in U. S. S. R., 3.2 in Sweden, 1.8 in U. S. A. and 0.3 in Japan and France which itself is quite inadequate. It is as little as 0.05 hectare in W. Bengal, 0.07 hectare in Kerala and Tamil Nadu each; 0.08 hectare in Bihar; 0.09 hectare in Punjab and U. P., and 0.11 hectare in Gujarat.

Forest Area in India, 1974-75 (Thousand hectares)¹

<i>State</i>	<i>Reporting area</i>	<i>Forest area</i>
Andhra Pradesh	27,440	6,260
Assam	7,852	2,031
Bihar	17,330	2,814
Gujarat	18,812	1,576
Haryana	4,404	107
H. P.	5,100	2,806
J. & K.	4,579	2,770
Karnataka	19,050	2,876
Kerala	3,859	1,055
M. P.	44,263	14,385
Maharashtra	30,758	5,348
Manipur	2,211	602
Meghalaya	2,257	740
Nagaland	1,653	288
Orissa	15,540	6,088
Punjab	5,033	212
Rajasthan	34,268	1,640
Tamil Nadu	13,008	1966
Tripura	1,048	630
U. P.	29,861	5,129
West Bengal	8,856	1,188
Union Territories	9,167	7,325
Total India	3,04,139	65,548

1. *Indian Agriculture in Brief*, 1977, pp. 46-47.

"The result of this unequal distribution of the forest area is that they have meant to the peasant the denial of a flat roof over his house, the door gaping wide without shutters and furnishings without any furniture. It has pulled down the standard of his cultivation by obliging him to burn his manure in the absence of any firewood. It has adversely affected his animal husbandry by reducing the supply of fodder." Sir Howard remarked "Probably 90 per cent of the plains villages of U.P., probably half of Gujarat/Maharashtra and all the centre and west of Bengal, much of Bihar and the coast-lands of Orissa contains populations with an almost completely unsupplied demand for forest produce."² It would, therefore, appear that there is a great need not only for increasing the proportion of forest area for the country as a whole but also a redistribution of it. In other words, while there may be still some scope for clearance of forest lands in M.P., and Orissa there is a great need for afforestation in states like U.P., Bihar, Bengal, Maharashtra, Tamilnadu and Andhra Pradesh. In addition to above, it would also be necessary to readjust the regional distribution of forests to a certain extent so as to make it more rational and to supplement this minimum forest cover with a penumbra of other vegetal cover in such a manner as would not seriously encroach on crop-lands and yet would fulfil the protective functions.

Importance of Forests in National Economy

Trees have a rightful place in the general economy of the country. Forestry is not a mere handmaid of agriculture but an inexhaustible reserve for providing subsistence to our growing millions. For, "Trees mean water, water means bread, and bread is life." The *Puranas* rightly said that, "One tree is equal to ten sons. And what a son ! he gives moisture to land, gives breeze and shade, saves land from erosion, gives dry leaves for compost and rich fruits for food : What a son ! he wants care and water but for five years, wants no milk, no nurse."

Forests are indispensable for the national development and fully grown up civilisation. "Indeed civilisation has been nursed, nourished and grown to manhood in the regions of temperate natural vegetation." A French proverb rightly says, "Forests precede civilisation but deserts succeed them."³ To an agricultural country like India, their importance can hardly be exaggerated.

Direct Benefits

(i) Although the productive functions of forests in India are not *prima facie* so important as the protective functions, still they are not negligible. Compared to the 42.6 per cent of the national

1. Baljit Singh, *Whither Agriculture in India*, 1945, p. 31.

income (Rs. 60,670 crores) which is contributed by agriculture (Rs. 26,132 crores) the direct contribution of forestry is 2.7 per cent (or 781 crores) (1975-76).

*Contribution of Forestry to Agricultural and National Income
(at current Prices)*

Year	Forestry	Agriculture	Total National Income
(In crores of Rupees)			
1960-61	174	6,570	133,66
1965-66	298	9,523	207,86
1970-71	433	16,251	342,17
1971-72	470	16,467	360,17
1972-73	525	17,500	391,87
1974-75	667	27,476	584,85
1975-76	781	26,132	606,72

(ii) They provide fodder for about 179 million cattle, 58 million buffaloes, and 120 million other livestock. They are the homes of 500 types of animals. They provide edible fruits and roots of which the poor readily avail themselves.

(iii) They provide wholtime daily employment to about 15 lakh persons engaged as wood-cutters, sawyers, carters, carriers, and craftsmen, and in other related forest industries.

(iv) They are also the homes of India's submerged humanity—the tribals numbering 38 lakhs. They are ecologically and economically a part and parcel of the forest environment.

(v) Indian flora is rich in composition and value. India has 5,000 species of wood, of which about 450 are commercially valuable and are used for extracting acetic acid, acetone, methylalcohol, certain oils, creosote and valuable drugs like sulphonamide and chloroform. The total standing volume of timber in the country is 85,696 m. cu. metres of which 93 per cent are non-coniferous and 7 per cent are coniferous. India's forests provided annually about 192 lakh cu. metres of timber and fire-wood valued at Rs. 59 crores in 1964-65; 228 lakh cu. metres valued at Rs. 91 crores in 1970-71; 229 lakh cu. metres valued at Rs. 122 crores in 1972-73,¹ and 165 lakh cu. metres valued at Rs. 179 crores in 1974-75.

(vi) Forests provide raw materials for a number of industries, viz., broom making, silk worm rearing, lac, toy making, leaf plate making, sawmills, match, plywood, paper and pulp, pencil making, tea chest, fibre board, chipboard, etc.

(vii) They also provide major and minor forest produce, such as, timber, round wood, pulp-wood, charcoal, fire-wood, and minor produce like bamboos, canes, drugs, spices, edible fruits and vegetables, fibres and flosses, fodder and grazing grasses, gums and resins, rubber and latex, incense and perfume woods, dyeing and tanning materials, bidileaves, vegetable oils and oil-seeds, sandal wood, oil, lac, ivory, honey, bees-wax, myrobolans, cutch and kutha, essential aromatic oil grasses like lemon grass, rosha grass, munj grass, khas, tiger grass etc. Medicinal herbs like atropa, *sarsaparilla*, *chinchona*, *mentha-raufofolia*, *Shingli Mingli*, *dhatura*, *colchicum luteum*, *ephedra*, *physochlaina paelia*, *Japanese mint*, belladonna, *nux vomica*, aconite, *tyoscyamens* etc. The value of minor produce exceeds Rs. 50 crores per year.

The most important varieties of timber produced in the forests are : *senal*, *kikar*, *babul*, *deodar*, *sissoo*, *sal*, chir pine, blue pine, mango, teak, *haldu*, mulberry, etc.

The woods of India cover almost every commercial use, aeroplane, agricultural implements, axe and tool handles, bentwood articles, boat and ship building, bobbins, boot laces, brushes, buildings, carts and carriages, construction and general joinery work, co-operation, electric transmission poles, engraving and printing marine piles and harbour work, match splints and boxes, mathematical instruments, packing cases and boxes, pencils and penholders, picker arms, picture framing, plywood and lamin boards, railway carriages and railway keys and brake blocks, railway sleepers, rifle parts and gunstocks, road-paving blocks, shuttles, sports goods, tent poles and tent pegs, turnery, umbrella, pen and walking sticks.

Table below shows quantity and value of timber and the fire wood produced in India :

Production of Timber and Firewood

Year	Timber	Quantity (000 Cu. Metres)				Total	Total value (000 Rs.)
		Round Wood	Pulp and Match Wood	Fuel Wood	Charcoal Wood		
1	2	3	4	5	6	7	8
1950-51	2992	837	13	11166	781	15789	190807
1955-56	3394	720	42	9233	1576	13965	276882
1960-61	4526	753	80	11335	293	16944	497408
1969-70	9181			11487		20668	1070828
1970-71	9,655			12,090		21,745	1,080,381

1	2	3	4	5
1971-72	8,369	13,704	22,073	1,217,882
1972-73	8,472	13,149	21,611	1,234,650
1973-74	9,700	16,500	26,200	1,326,000
1974-75	9,800	16,500	26,300	1,786,300

Value of Minor Forest Products (In 000 rupees)

Products	1967-68	1970-71	1971-72	1972-73	1973-74	1974-75
Bamboos & Canes	31,017	39,455	42,270	53,293	92,800	110,500
Fodder & Grazing	13,871	12,722	13,820	14,370	16,400	31,000
Grass other than Fodder	5,766	5,453	5,112	2,717		
Gums & Resin	32,811	58,565	69,083	88,492		
Bidi Leaves	88,398	132,170	201,822	229,649	607,500	705,100
Lac	253	173	171	184		
Others	69,186	91,055	107,407	112,594		
Total	241,302	339,993	440,130	502,745	716,700	846,800

In 1950-51 the forests provided minor produce worth Rs. 69.25 lakhs ; in 1955-56, it was worth Rs. 80.17 lakhs ; Rs. 111.29 lakhs worth in 1960-61 and 158.59 lakhs in 1964-65 ; Rs. 502.74 lakhs in 1972-73 ; and Rs. 846.8 lakhs in 1974-75.

At present the production in India of different types of timbers is about 1.8 million tons and along with imports it gives a supply of a little more than 2 million tons—a little less than 1 1/2 m. tons being hardwood and a little more than 1 1/2 m. tons soft wood. Out of these 2 million tons, a little more than 1/2 m. tons is used for railway sleepers, other railway requirements and for the defence and civil departments, a little more than a third for match, plywood, tea, bobbin, and packing case industries and the remaining domestic and binding purposes.

Forest products earn foreign exchange by way of exports. The items of forest based industries obtain about Rs. 30 crores annually, and that of wood exports bring about four crores, and others like gum, resin, lac, seeds and flowers, fetch another 15 crores of rupees. The Marketing Research Corporation of India has estimated that these items can gradually step up to bring Rs. 33 crores by 1978-79.

Indirect Benefits

Forests offer many indirect benefits to the country such as :

- (i) They render the climate more equable and increase the relative humidity of the atmosphere and increase the precipitation of the moisture.

- (ii) They regulate water supply, produce a sustained feeding of springs and tend to reduce the violent floods and make the flow of water in the rivers continuous.
- (iii) In defending the land against the evils of erosion, aridity and climatic excesses, forests perform services no less valuable and no more expressible in terms of money than those rendered by the defence forces of a country.
- (iv) Forests are homes of rich and varied wild life. They provide natural habitat for hill and mountain fauna. About 500 types of mammals live in Indian forests.¹ Lion, tiger, wild ass, panthers, *barasingha*, *sambhar*, *nilgai*, elephant, cheeta, chinkara, wild buffaloes, one horned rhinoceros, black buck : musk deer, different types of birds, snakes, etc. abound in Indian forests.² In these forests exist national parks (Corbett, Kanha, Tarora, Palamau, and Hazaribagh), while notable sanctuaries are Kaziranga, Manas, Jaldapara, Sirisha, Gir, Jai Samudra, Periyar and Dachigam.
- (v) Numerous worms, insects and minute organisms feed on the humus and tunnel in the soil, thus making it suitable as a food for the plants.
- (vi) Decomposing leaves of trees increase the permeability of soil and improve its chemical and physical characteristics.
- (vii) Forests serve as strong line of defence and as a cover against aerial reconnaissance and attack. Use of artillery at close range and a free operation of mechanical units becomes extremely difficult in forests.

In brief "the trees have a great place in the economy of Nature. They hold up the mountains, they cushion the rain and storm, they discipline the rivers, they control the floods, they maintain the springs, they break the winds, they foster the birds, they keep the air cool and clean, they are the guardians of the perennial springs of water, they are the natural defenders of dust storms, they prevent erosion, they provide the fuel and timber. They make the hydro electric scheme possible and they give us a host of other products".²

Woytinsky and Woytinsky have rightly observed : "the protection forests afford in retarding the water run-off, in distributing rainfall, preventing erosion, reducing wind damage and safeguarding water supplies is often valued more than their output of woods."⁴

1. *Second Five Year Plan*, 1956, p. 298.

2. K. P. Sagreiya, *Forest and Forestry*, 1967, pp. 56-57.

3. *The National Forest Policy of India*, 1952, p. 22.

4. W. S. Woytinsky and E.S. Woytinsky, *World Population and Production: Trends and Outlook*, 1953, p. 686.

Forests, thus, constitute one of the most renewable nature resources.

Low Productivity of Forests and Its Causes

Indian forests are rich in varied resources but their productivity is very low. For example, in productive areas in well maintained forests, yield of about 2.75 tons per acre per annum is obtained of sal ; of 4.10 tons of deodar and 1.30 tons of chir.¹

The average per hectare production per annum of forests in India is estimated at about 0.53 cu. metres as against the world average of 2 cu. m.²

Further, on an average the growing stock per capita of the forest, in use is only 5.2 cu. metres as against 12.3 cu. metres for Asia, 24.0 cu. metres for Europe, 320 cu. metres for U.S.S.R., 94.2 cu. metres for U.S.A., and 46.7 cu. metres for the world. Per hectare, the growing stock is only 28 cu. metres and the average annual increment is only 0.5 cu. metre per hectare against the world average of 2.0 cu. metres, and our estimated potential of 5.0 cu. metres.

Italy with one-tenth of our area under forest gives a quarter more yield. France with one-sixth of our area under forest gives 2 1/2 times. China produces three times as much in terms of total production of forest goods with only 12 per cent more land under forest than in India.

The revenue from India's forests has so far been very negligible. The national average gross revenue per hectare from India's productive forests is only Rs. 21.50. The income from India's forest land, when compared with that in other countries of the world, will appear to be dismally low as is evident from the following table.

Revenue per hectare from forested areas in selected countries of the World³

Country	Gross forest Revenue per hectare	Net Revenue per hectare
	(Rs.)	(Rs.)
India	21.50	11.50
Austria	336.00	80.00
U.K.	N.A.	140.00
W. Germany	565.00	130.00
Switzerland	494.00	190.00

1. *Third Five Year Plan*, p. 363.

2. *Fourth Five Year Plan*, p. 206.

3. National Commission on Agriculture, *Interim Report on Production of Forestry-Man-Made-Forests*, 1972, p. 12.

Our productivity is about one-twentieth of that in the European countries and about one-tenth less of our potential productivity. This is due to a number of factors such as:

(i) Large areas of unclassified State forests and the former private forests, acquired by the Government after the abolition of zamindari, are under-stocked and require to be rehabilitated. The difficulty in organizing the commercial exploitation of these products arises from their erratic distribution. Some products like *Ephedra*, *Ratanjot*, and *Kuth* occur at high elevations. Myrobalans are usually dispersed over extensive areas rendering the cost of collection prohibitive. Herbs suffer from the same handicap.

(ii) Customary forest rights and concessions granted to the tribals and forest people for free grazing of their cattle in the forests and removing timber, fuel and manure and minor forests produce have been very liberally exercised by them for a long time and this has led to the reduction of forest yield. Further, in the unreserved forests and the forests managed by the Revenue Department, cultivation has long been permitted and this has heavily encroached upon the forest land.

(iii) The utilisation of forest trees for fuel and charcoal is a wasteful method and leaves much to be desired.

(iv) The large animal population reduces the possibility of efficient forest management, preservation and expansion through afforestation.

(v) Some of the forests (about 43 per cent) have not yet been opened up sufficiently and, therefore, only the most valuable trees can be extracted economically, others go to waste. Besides very few types in Indian forests are gregarious to enable their economical exploitation.

(vi) An appreciable proportion of trees are malformed or consist of species which are slow growing and poor yielders.

(vii) Antiquated transport and lack of proper bridle paths-rope ways and the road system in the forest areas are other bottlenecks in the full utilization of resources.

(viii) The methods of fellings, fashioning and slow means of transportation entail much wastage and the costs are also high.

(ix) Large quantities of inferior woods which could be put to economic use through seasoning and preservation treatment remain only partially utilised.

(x) There are no commercial forests and most of the forests are meant for protective purposes. Reserved forests represent 48 per cent: Protected forests 32 per cent and unclassified forests 20 per cent. Protected and unclassified forests are forests in name only.

(xi) The yield from forests is low because static conservancy (or natural growth of forests) is even now practised. This had its importance when scientific management had just begun. But now it is not suitable.

(xii) There are over one million hectares of over-aged inaccessible forests in H.P. and U.P. in remote areas which are deteriorating and await immediate exploitation. The stands in these forest areas are good and valuable. They need good management practices.

(xiii) Many species of wood possess such defects as excessive harshness, heaviness, twisted grains, brittleness, presence of oils or abrasive materials, poor seasoning ability and impregnation qualities which have rendered them economically useless.

(xiv) *Lastly*, inadequate protection against fire, plant diseases, insects, lack of complete information regarding timber supplies and other forest resources, inadequate research facilities and insufficiency of trained personnel are other factors which militate against full production.

The obvious requirement, therefore, is to undertake silvicultural operations on a much wider scale. Increased output can be obtained from year to year through: (i) adoption of intensive development schemes including the planting of quick growing, suitable and high yielding species-indigenous or exotic in compact blocks in suitable locations; (ii) selection of high yield areas; (iii) introduction of improved techniques of logging, and extraction; (iv) development of forest communications for opening the hitherto inaccessible forests; (v) increased use of preservation and seasoning processes by establishing preservation plant and seasoning kilns in the heart of the forest area; (vi) the linking of forest programme with the schemes of industrial development; (vii) protecting forests from depleting forces like forest fires, adopting quarantine measures, air dusting and spraying, and (viii) undertaking a reliable inventory of forest resources, their extent, location, volume, composition, standing wood volume, rate of growth and the quantities of various products, the cost at which these could be procured by industries, statistics of removal, employment opportunities, trade prospects and consumption of forest products.

Forest Management Planning

Forests are a renewable resource. Forest management and development planning should aim at utilising the available forest resources and simultaneously regenerating the forest of the species similar to the existing ones or quicker grown, more valuable and suitable for a particular site. An objective of forest management is to ensure at least sustained and generally increasing yields of forest products in perpetuity. For this it is necessary to safeguard that the site quality of any particular forest does not deteriorate.

The other objective is the maximisation of benefits in order to ensure physical protection and simultaneously to produce the most needed species.

NATIONAL FOREST POLICY

During the early years of the British rule, when conditions were unsettled, reckless destruction of forests went on unchecked. The East India Co. was more interested in immediate gains than in longterm benefits to the country. With the transfer of authority in 1857 from the East India Co. to the British Crown, however, there was a welcome change of emphasis from immediate gains to long-term benefits. The rapidly shrinking supplies of timber and firewood and the extensive soil erosion which followed deforestation compelled the Government to pay some attention to the urgent need for the preservation of forest wealth. Therefore, a forest policy had to be evolved. The first Inspector General of Forests was appointed in 1863 and in 1894 a Resolution on forest policy was issued. This Resolution said that ; (i) forests should be managed to promote general well being of the country ; (ii) they should be maintained for the preservation of climatic and physical conditions of the country, and (iii) to supply and fulfil the needs of the people for fuel and industries. This policy related to state forests in British provinces and forests were divided into ; (a) forests, the preservation of which was essential on climatic or physical grounds; (b) forests that afforded a supply of valuable timber for commercial purposes; (c) minor forests ; and (d) pasture lands.

Under the Indian Forest Act of 1927, three categories of forests were recognised : *Reserved forests* (the most strictly controlled), *Protected forests* (less strictly controlled), and *Unclassed forests* (which include 'village forests' or land classed as 'culturable waste').

Since the first systematic Forest Policy was declared, changes of far-reaching importance had taken place in the economic field. Most important of these were :—

(i) A substantial increase in human and bovine population which led to a heavier pressure on forest demanding more land for agriculture and pastures.

(ii) A heavy dependence on forest resources during the two world wars which led to rapid depletion of these resources.

(iii) Independent India launched reconstruction schemes such as the river valley projects, agricultural colonization schemes, development of forest based industries, and the laying down of new railway lines - all leaned very heavily on the forest products, and lastly,

(iv) Forest began to be regarded as the foster mother and not as the hand-maid of agriculture.

New Forest Policy of 1952

After Independence, in recognition of the importance of forests in the national economy, and to ensure the best possible land use and land management in the country so that there could be a balanced development of forest and agriculture and the needs of the industries and transport could be easily met, a new Forest Policy was enunciated on May 12, 1952. The main principles on which it is based are:¹

- (1) That a system of balanced and complementary land use is evolved under which each type of land is used according to its land use capability so that it could produce more and deteriorate least.
- (2) That it satisfies the need for checking: (i) denudation on mountainous regions on which depends the perennial water supply of the river systems whose basins constitute the fertile core of the country; (ii) the erosion progressing apace along the treeless banks of the great rivers (leading to ravine formations and vast stretches of undulating waste lands depriving the adjoining fields of their fertility); and (iii) the invasion of sea sands on coastal tracts, and the shifting of sand dunes (more particularly in the Rajasthan desert).
- (3) That the tree lands should be established wherever possible, for improving the physical and climatic conditions and for promoting the general well-being of the people.
- (4) That progressively increasing supplies of fodder (for grazing), timber (for agricultural implements) and firewood (for releasing the cow dung for use as manure) should be ensured to the cultivators.
- (5) That the forests should be maintained on the principle of progressively increasing and eventually the highest sustained yield to meet the requirements of defence, communications and industry.
- (6) That the maximum annual revenue should be realized (in perpetuity) to fulfil the above needs.

Main Features of the Policy

The 1952 Forest Policy opposed the indiscriminate extension of agriculture by the extension of the forest area, as this not only deprives the local population of wood, grass, etc., but also deprives the land of its natural defences against dust storms, hot winds and erosion. It emphasized the need for affording protection to wild life by its proper management for scientific study and for recreational purposes through provision of acturaries at appropriate places. It emphasized that the notion widely entertained—that forestry has no

1. Government of India, *Ministry of Food and Agriculture*. Resolution No. 13-1-52 F of 12 May, 1952.

intrinsic right to land but may be permitted on sufferance on residual land not required for any purpose—has to be combatted. It further said that it should be the duty of the forester to awaken the interest of the people in the development, extension and establishment of tree lands wherever possible and to make them tree-minded.

The Policy laid stress on : (i) weaning the primitive people, by persuasion, of the baneful practice of shifting cultivation ; (ii) increasing the efficiency of forest administration having adequate forest laws ; (iii) providing adequate facilities for the management of forest and for conducting research in forestry and forest product utilization ; (iv) controlling grazing in the forests ; and (v) the needs for promoting the welfare of the people.

In order to make up the deficiency of forest resources in the country, the policy laid down that the average proportion of the forest should be raised to 33.3 per cent from the present area of 20 per cent, i. e., at least one-third of the area should be under forests with regional differences. For insurance against erosion, floods and denudations in the Himalaya, the Deccan plateau and other mountainous regions, 60 per cent of the areas in these parts should be under forest ; while in the plains this proportion should be 20 per cent.

For meeting the deficiencies for fuel wood, it was suggested that tree lands should be extended on river banks and other convenient places unsuitable for cultivation.

In view of the above approach, forests were classified into protective forests, national forests, village forests, and tree lands.¹

The National Commission on Agriculture has observed that "the National Policy should rest on two pivotal points, viz., to meet the requirements of goods, (i. e. industrial wood for forest based industries, defence, communications and other public purchases and small timber, fuel wood and fodder for the rural community) and to satisfy the present and future demands for protective and recreative functions of the forests. All the requirements must be met in full and

1. *Protective Forests* are those which are preserved for physical and climatic reasons. These have been needed for reconditioning the mountainous regions, river valleys and coastal lands.

National forests are those which are maintained and managed to meet the needs of defence, communication industry and other general purposes of public importance ; and developed for attaining national self-sufficiency in timber supplies.

Village forests are those which are maintained to provide firewood to the villagers and to yield small timber for agricultural implements and other forest produce for local requirements and to provide grazing to the village cattle.

Tree lands are those areas which are outside the scope of the ordinary forest management and are essential for the amelioration of the physical conditions of the country.

self-sufficiency achieved as early as possible. The policy should clearly indicate the inter-relationship of forest economy with rural and tribal economy. The factors to be considered are : (a) employment ; (b) right of the user ; and (i) involvement of the local people."¹

FOREST DEVELOPMENT PROGRAMMES

For soil and water conservation and satisfaction of the present and prospective demand of the people for fuel wood and of the industries for industrial woods and other raw materials forest development has been regarded as a *sine qua non* for the economic progress of the country. With this aim in view, the improvement of the existing forests received attention in the Five-Year Plans. "The first two Plans put considerable emphasis on their consolidation, improvement of degraded forests, establishment of economic plantations of fast growing trees and improvement of communications. The scheme for demarcation of ex-private forests and preparation of maps (of over 18,000 sq. miles), were taken up. Inferior varieties of timber were better utilized by seasoning and preservation processes. Improvements were made in modern logging techniques, especially in the mountainous forests of Punjab, Himachal Pradesh, Uttar Pradesh, Jammu and Kashmir. Forest roads were built up (about 9,000 miles). New plantations of match wood (extending over an area of about 55,000 acres) and industrial wood (over an area of 330,000 acres) were undertaken. Modern system of intensive forest management was adopted. Schemes undertaken by the Central Government related to forest research, forest education and preservation of the wild life. There are now about 80 sanctuaries covering an area of 15,000 sq. km. A sum of Rs. 8.5 crores was spent during the First Plan and Rs. 21.2 crores was spent during the Second Plan, the percentage of the Plan outlay on forests being 0.49 and 0.50 respectively."¹

Vana Mahotsava was inaugurated in 1950 to create an enthusiasm in the popular mind for the preservation of forests and planting of new trees, as "trees mean water, water means bread and bread is life". It was also hoped that it would create tree-consciousness among the people. The planting of trees during *Vanmahotsava* was to serve the following purposes :

- (i) To provide fuel and thus release cowdung for use as manure.
- (ii) To increase production of fruits and add to the potential food resources of the country ;
- (iii) To help creation of shelter-belts around agricultural fields, to increase their productivity ;

1. Planning Commission, Government of India, *Third Five Year Plan*, New Delhi, 1961, p. 363-366.

- (iv) To provide fodder leaves for cattle to relieve intensity of grazing over reserved forests ;
- (v) To provide shade and ornamental trees for the landscape.
- (vi) To provide small poles and timber for agricultural implements, house construction and fencing ;
- (vii) To help conservation of soil and further deterioration of soil fertility ;
- (viii) To inculcate tree-consciousness and love of trees amongst the people ; and
- (ix) To popularising the planting and tending of trees in farms, villages, municipal and public lands for their aesthetic, economic and protective needs.

But the programme did not generate the enthusiasm and tree-consciousness amongst the people that it was intended to. On the contrary, a situation has developed in which it is being looked upon as a mere annual ritual observed mainly by the Government without any regard to the prevailing conditions, such as the onset of monsoon and proper after-care.

The *Third Plan* emphasized the protective as well as the productive role of forests in the Indian economy and suggested a long term objective that a third of the land area should be under forests. It laid emphasis on the measures to meet long term needs of the country for timber and other forest products. The immediate objective was to increase the output from forests through intensive management and improved methods of timber extraction to develop forests communications and to bring about better utilization of forest products through the increased use of preservation and seasoning process. Out of a provision of Rs. 51.4 crores, the actual expenditure incurred during 1961-66 was about Rs. 45.9 crores. As a result of the merger of princely States and abolition of the proprietary rights, large tracts of degraded forests situated in the erstwhile States and zamindari estates came under Government control.¹ "There was a considerable shortfall in farm forestry schemes. The target for all-India was 6,39,232 acres, while the achievement was 52,120 acres only. Survey and demarcation also lagged behind the target. The target was 59,714 sq. miles+10,350 miles, and the achievement was 49,424 sq. miles+18,652 miles. Only 7,699 miles of roads could be constructed against the target of 10,017 miles. Rehabilitation of degraded forests did not progress well in several States. The targets was 5,15,400 acres while the achievement was 5,30,656 acres."² During 1961-69, plantation of teak and other broad leaved species and of conifers were raised on an area of about 3,94,000 hectares, while an area of about 2,46,000 hectares was

1. L. C. Sharma and K. B. Lall, "Forestry Development—In Analysis," *AICC Economic Review*, Vol. 18, No. 21, May 15, 1967, p. 32.
 2. *Fourth Five Year Plan*, p. 206.

planted with quick growing species. An area of about 30,000 sq. km in nine States was covered under a new scheme of pre-investment survey of forest resources. With a view to encourage development extension of forestry, seeds and saplings were made available to 1,34,000 hectares.¹ During 1966-69, Rs. 42.1 crores were spent on forestry programmes.

The *Fourth Plan* envisaged a high increase in the demand for various forest products both for industrial and for fuel purposes. The consumption for industrial wood alone was expected to increase from 11 million cubic metres in 1968-69 to 16 to 17 m. cu. metres by 1973-74. It was provided to increase the supply about 13.5 m. cu. metres by 1973-74. To meet this deficiency three important schemes were undertaken, viz., (i) plantation of quick growing species 5.6 lakh hectares, suitable for industries like match, paper, plywood, pulp and boards ; (ii) plantation of economic species covering 4.15 lakh hectares (like teak, semal, sissoo) ; and (iii) plantation to be raised under the scheme of rehabilitation of degraded forests (1.8 lakh hectares). Besides, farm forestry programmes with a target of covering 75,000 hectares was also to be undertaken for raising the production of fuel wood on all waste lands contiguous to the forests and in large block of 50 acres and above. About 15,000 kms. of forest roads was to be constructed with a view to increase the extraction of the forest produce. Provision was also to be made for the training of forest officers. The *Fourth Plan* made a provision of Rs. 94.9 crores. During the *Fourth Plan*, in the sector of forestry three main objectives were to be achieved ; (a) to increase the productivity of forests, (b) to link up forests development with various forest-based industries ; and (c) to develop forests as a support to rural economy. Intensive exploitation and rational utilization of existing forest resources was aimed at. In areas which were already being exploited improved methods of working including reduction of waste, was to be introduced ; and the consolidation and scientific management of hitherto unorganised forest and protection against unregulated cutting, grazing and fire was to be undertaken. Pre-investment survey of forest resources was to be extended to 75,000 sq. km. of forest areas.

"During the *Fourth Plan*, quick-growing species were planted on 2.51 lakh hectares as against the target of 2.87 lakh hectares. In this respect the succession has been rather limited. The economic plantations for industrial and commercial uses was raised on 2.89 lakh hectares, against the target of 3.39 lakh hectares, and farm forestry-cum-firewood plantation exceeded by 5,000 hectares (from 75,000 to 80,000 hectares). Central programme of pre-investment survey of first resources was spread over 75,000 sq. kms. of forest area. Rs. 0.90 crore was spent over the forest research programmes."²

1. *Ibid.*, p. 213.

2. *Draft Fifth Five Year Plan, 1974-79*, Vol. II, 1974, p. 39.

The primary objective of the Draft Fifth Plan is : (i) To initiate measures for increasing production of industrial wood and other forest products by a change over from conservation oriented forestry to a dynamic programme of production forestry, aiming at clear-felling and creating large man-made forests with the help of institutional financing. The produce from clear felled areas is to be used in wood-based industries by locating additional units wherever required ; (ii) To develop farm forestry and improvements of degraded forests to increase the fuel and timber supply in the rural areas, (iii) To assess the present growing stocks, increments and potential increments by forest divisions, natural regions and timber states, along with a proper information system on the forest working plans and working schemes.¹

These objectives are based upon the National Commission on Agriculture's recommendation. According to it, "There should be a change-over from the present system of conservation oriented forestry (which is limited to market demand and suffers from inadequate funds for raising plantations) to a more dynamic programme of production forestry. Considering the advantages of an aggressive man-made forestry programme² we feel that future production programme should concentrate on clear felling of valuable mixed forests, mixed quality forests and inaccessible hard wood forests and planting with suitable fast growing species yielding higher return per unit area. The resulting produce from clear-felled areas should be utilised in wood based industries by locating additional units wherever required."³

The Fourth Plan had estimated that the consumption of industrial wood in 1968-69 would be 11 million m³; and the demand by 1973-74 at that time was projected to 16 to 17 million m³, out of which 13.5 million m³ would be available for consumption. It is now estimated that there was a total consumption of 16 million m³ in 1970. The National Commission on Agriculture has estimated that India's industrial forestry production programme must be geared to

1. *Ibid*,

2. The advantages envisaged are :

- (1) Immediate increase in timber and pulpwood availability for meeting the present demand.
- (2) Creating incentive for increasing installed capacity of industries consuming forest produce thereby creating additional employment in secondary and tertiary sectors.
- (.) Planning future production of pulpwood according to market preferences, both internal and international, and reduction of wasteful growth.
- (4) Built in soil conservation programme.
- (5) Large scale additional employment opportunities in both skilled and unskilled categories in the primary sector.
- (6) Increased and planned recreational facilities—N. C. A., *Interim Report on Production Forestry-Man-Made Forests*, 1972, pp. 26-27.

3. *Ibid.*, p. 27.

increase production from the present level of 8.92 million m³ to 25.55 million m³ by 1980 and 41 million m³ by 1990. Of the present production of 8.92 million m³, the hardwood production is about 7.63 million m³ and conifers 1.29 million m³.....Of the total consumption of 203 million m³ of fuel only 13 million m³ is said to come from the forests.....Bulk of fuelwood comes from treelands but in actual fact this may also include substantial pilferage from the forests.....The requirements for 1980 and 1990 indicate that a substantial quantity of raw material is to be produced from India's forests. India will have to produce about 4.95 million m³ of conifers by 1980 ; and an additional 4.10 million m³ by 1990. During these 20 years, about 12.98 million m³ and 11.04 million m³ of hardwood respectively. This future supply will come from the coniferous forests of Northern Himalaya by infra-structure development and by clear felling of presently inaccessible hardwood forests, mixed forests of low economic value and valuable forest stands capable of significantly increased production from unit areas.¹

Total Industrial Requirement of Woods by 1980 and 1990²

	By 1980 (In 000 m ³)			By 1990 (In 000m ³)		
	Conifers	Broad leaved	Total	Conifers	Broad leaved	Total
Pulpwood	1,555	3,478	5033	4,461	8,271	12,737
Sawn wood & Sleepers	1,816	10,836	12,652	2,395	14,605	17,010
Panel Products	189	755	944	281	1,126	1,407
Round Wood	1,482	5,542	6,927	1,887	7,549	9,436
Total Industrial Wood (ex: Bamboo)	4,945	20,611	25,556	9,024	31,551	40,575

According to the Commission an additional investment of Rs. 242 crores will be required for clear-felling and plantations and Rs. 875 crores for news print and printing and writing paper plantations by 1980. By 1990, the investment will rise to Rs. 306 crores and Rs. 1187 crores respectively.

Important physical targets in the forestry section envisaged for the Fifth Plan are :

(1) Plantations over 11.1 lakh hectares will be raised. This includes plantations of quick growing species, and other species of commercial and industrial importance. The economic plantation would consist of species like *teak sal, chil, deodar, fir, spruce, semal*

1. *Ibid.*, pp. 29 and 31.

2. *Ibid.*, p. 30.

and other match wood, plywood species, *khair*, sissoo, bamboo, etc. 7.6 lakh hectares of such plantations will be raised. (ii) Plantations of quick growing species mainly *eucalyptus* hybrid will be raised over an area of 3.50 lakh hectares. Deficiencies of fuelwood would be met by raising mixed plantations on waste lands, community lands and in Government forests. Such plantation would be raised on 1.0 lakh hectares. (iii). In areas deficient in forests (as in North Indian plains and other intensively cultivated places) plantations in the lands along with the roads, canal sides, railway tracts, and flood embankments will be developed to supply timber and fuel wood. Such work will be taken along a length of 32,000 km. (iv) Farmers will be encouraged to raise large number of plants supplied to them, in the Gangetic valley and the costal plains-to the extent of 80,000 hectares. Forest surveys will cover all the reserved forests at least 50% of the protected forests. Pre-Investment Survey will be converted into a national forest survey. This programme will include computation of forest growing stocks, increments and potential increments in different forest tracts, divisions, natural regions including evaluation, co-ordination and monitoring of forest development programmes..... Besides in Jabalpur and Gauhati additional research centres will be set up. Roads will be improved and extended in selected areas. State Forest Departments will be suitably strengthened.¹

Fifth Plan Targets for Forestry Development²

Item	Unit	Base Level 1973-74	Targets 1978-79
1. Production of Industrial wood	million m ³	9.4	12.3
2. Plantation of quick growing species	000ha	510	860
3. Eco Plantations of Industrial and Commercial uses	000 ha	850	1,610
4. Farm forestry	"	80	160
5. Mixed Plantations	"	140	240
6. Plantation on lands along roads, canals, etc.	000 km	Not known	32
7. Communication	"	45	60
Outlay	Rs. crores	93	206

The following table shows the proportion of investment in plantation in successive Plans :³

1. Draft Fifth Five Year Plan, 1974-79, Vol II, pp. 39-40.
2. *Ibid.*, p. 39.
3. Central Forestry Commission, Ministry of Agriculture.

Investment in Man-made Forest

Plan Period	Total Investment on forestry sector (Rs. crores)	Total Investment in man made plantations (Rs. crores)	Investment in man-made plantations as % of total Investment	Total area under man-made forests (hectares)	Investment on Plantations per hectare (Rs.)
1951-56	8.5	1.4	16	50,023	280
1956-61	21.2	6.8	32	217,397	313
1961-66	45.9	15.0	32	324,860	462
1966-69	40.1	18.4	45	319,301	576
1969-74	94.9	38.0	41	520,040	624

It would be interesting to note that the money allotted for forestry development has been very meagre. It was 0.4 per cent of the total Plan outlay in 1951-56, 0.5 per cent in 1956-61, 0.5 per cent in 1961-66 ; 0.6 per cent in 1966-69 and 0.6 per cent in 1969-74. As against these percentages, agricultural production programmes too received meagre amount. It was 10.1 per cent ; 5.5 per cent ; 7.9 per cent, 14.2 per cent ; and 14.7 per cent respectively.

During the fifth Plan, Rs 206 crores were provided for forestry development. The main thrust of developing during the Draft Five Year Plan (1978-83) will be on the accelerating production forestry, substantially enlarging social forestry and linking forestry development with the economy of the people living in and around forest areas.¹ For this purpose Rs. 450 crores have been provided.

SOCIAL FORESTRY

In the past, *farm forestry* (i. e. the practice of forestry in all its aspects on farms or village lands, generally integrated with other farm operation) was adopted with a view to creating new wood resources and replacement of wood harvests in farm lands. But now it is being increasingly realised that there are many other needs of the rural people, which need be satisfied, such as provision of grazing, supply of grasses and fodder, thorns for fencing, protection of agricultural lands against wind. Then there is also the need for recreation for urban people. Therefore, the social forestry tries to satisfy these social demands, which farm forestry (or extension forestry) is inadequate to meet.

The objectives of social forestry, therefore, are²

- (i) Fuelwood supply to the rural areas and replacement of cow-dung ;

1. *Draft Five Year Plan, (1978-83)*, 1978, p. 149.

2. National Commission on Agriculture, *Interim Report on Social Forestry* 1973, p. 12.

- (ii) Small timber supply;
- (iii) Fodder supply ;
- (iv) Protection of agricultural fields against wind ; and
- (v) Recreational needs.

All these are basic and economic needs of the community, aimed at bettering the conditions of living.

Social forestry, therefore, is concerned with farm forestry, extension forestry, reforestation in degraded forest and recreation forestry.

(a) **Farm forestry** i.e., raising rows of trees on bund or boundaries of fields and the individual trees in private agricultural lands, with a view to (i) supplement production of fuelwood and small timber to meet increasing requirements ; (ii) release cowdung for use as manure ; (iii) increase production of leaf fodders and (iv) create a diverse ecosystem by having trees interspersed with cultivation. *Casuarina*, *khejri* (*Prosopis Cineraria*) ber (*zizyphus*) segwa (drumstick) babul (*Acacia arabica*) sissoo (*Dalbergia sissoo*), and *Pongamia Pinnata* may be grown in dry and arid areas and in certain coastal areas where sandy soil occurs. These will serve as wind-breaks. Farm forestry should be so organised that a substantial programme of planting trees is taken up by the farmers themselves. Tree species may be chosen with care taking into account the acceptability of the farmers. The agency entrusted with the implementation of this programme should also look after the marketing of the produce, mature, to the best advantage of the farmers. According to N.C.A. a pilot scheme for development of farm forestry should be taken up in 100 selected districts in the central sector, out of these 100 districts 60 should be in areas with advanced agriculture where fuel and timber are scarce, and 40 should be in the dry and arid zones.¹

(b) **Extension Forestry**, is concerned with : (a) mixed forestry comprising raising of grass and leaf fodder, fruit trees, and fuelwood trees in suitable waste lands, Panchayat lands and village commons, (b) In drought-prone area permanent vegetation may be raised so that the water regime could be improved, climate, excesses could be moderated, and local people could be made more dependent on forestry than on agriculture. (c) Mixed plantation would yield benefit in the form of grass and easily marketable fruits like ber, cashew, segwa within 4 to 5 years. Mixed forestry on waste lands should cover an area of 1 lakh hectares.

(c) **Shelter Belts** i.e., planting of wind breaks in arid areas where tree growth is sparse to prevent serious loss of top soil through checking soil erosion. Agricultural crops and orchards may be raised for providing extensive and long barrier of trees and tall grasses in the form of shelter belts. These shelter-belts may also provide fuel-

1. *Ibid.*, pp. 19-33.

wood and small timber for the people in the neighbourhood. Such shelter-belts may be raised on 1 lakh hectares of land distributed in Haryana, Punjab, Rajasthan, Gujarat, Andhra Pradesh, Karnataka, M. P., and Maharashtra.

These will hold up the movement of shifting sand and thus save the agricultural fields as well as the roads and railway tracks from damage by moving sand dunes. Experiments carried out in USSR and USA indicate that crop yields can be increased by about 150 per cent and the fodder increase may be as high as 300 to 400 per cent.¹

The Central Arid Zone Research Institute has advised that in the arid zones with wind velocity not exceeding 20 km. per hour, a typical belt may consist of 3 to 5 rows and in some areas even 7 rows planted at a distance of 4 x 4 metres.

(d) **Planting on lands on sides of roads, canal banks and railway lines**, with a view to getting fuelwood and smaller timber for the population. Afforestation in these areas should be taken up by the Forest Departments. The N.C.A. suggests a 10 to 15 years' programme for covering these strips. Annually about 8000 km. may be planted with an average of 6 rows, one row of shade trees and two rows of fuelwood trees on either side.²

(e) **Reafforestation in Degraded Forests**. should be undertaken to achieve these objectives : (i) to grow short rotation fuel and timber species for meeting the increasing fuelwood and small timber requirements ; (ii) to organise fuelwood supplies at reasonable rates ; (iii) to tie up degraded forest areas with the nearby rural and semi-urban centres for their requirements of fuel and small timber ; (iv) to provide employment to rural people through forest practices and, where feasible, through agri-silviculture (as is being done in Kerala and U. P.) (v) to rehabilitate the degraded forests in the process. Such reafforestation should be taken up on at least 3 lakh hectares of degraded forests.³

(f) **Recreation Forestry**, which is concerned with providing of small blocks of forests close to urban areas, for recreation of the urbanites or tree groves created for picnic corners. "Near Bangalore at Bannerghatta a National Park has been established to preserve both the wild fauna and the tree growth on an area of about 100 sq. Km. Within this complex, safari parks with separate large enclosures for lions, tigers, baboons have been carved out covering a total area of 14 sq. km. The picnic corner covers an area of about 12 hectares."⁴

1. *Ibid.*, pp. 32-33.

2. *Ibid.*, p. 36.

3. *Ibid.*, pp. 39-40.

4. *Ibid.*, 41-42.

Recommendation of the National Commission on Forestry Development

The National Commission on Labour has suggested that :

- (i) Forests must have an adequate share of land and deforestation should not be permitted without the approval of the state government.
 - (ii) All forests, under management of other departments of the Government, should be transferred forthwith to the Forest Department.
 - (iii) Private forests should also be regulated and controlled.
 - (iv) Bearing in mind the future demand on the forests, all forest lands should be functionally classified into : protection forests ; production forests ; and social forests.
- “Protective influence of the forests, specially on hill slopes, watershed of rivers, sea forests and other localities, vulnerable to erosion and degradation, should be developed by suitably managing existing forests and providing for their rehabilitation and improvement.
- “Production forests must be managed to meet the needs of the existing and projected industries and for well established uses. Growing of plantation crops in suitable localities on forest lands should be undertaken.
- “The social function of forests should meet these needs of the community for agricultural timber and fuel-wood ; grazing and grass ; and recreation.
- (v) Steps should be taken to provide employment to local people specially the socially backwards and unemployed and under employed agricultural labour.
 - (vi) The National Forest Policy should be revised to take into account the above and also other related needs, like controlled grazing, regulation of shifting cultivation, welfare of tribals, protection of wild life and plants, forest research and education, extension and publicity, legislation on forestry and strengthening of forest administration at all levels.”

Conclusion

Forest area is very disproportionately distributed in the country and even this much is not fully exploited. This necessitates the increasing of forest area in the country and more intensive development of areas which are lacking in forest wealth. It is essential that a sustained increase in production should be secured from year to year through intensive development schemes such as the selection of high yield areas, planting of quick growing species, introduction of improved logging and processing techniques, development of

communications and the linking of forest development with specific schemes of industrial development. To meet the acute shortage of industrial woods, intensification of production, development of forest areas in the hills, improved utilisation of low grade timbers, economy in fuel wood consumption and systematic surveys of forest resources in relation to industries should be undertaken in right earnest. Forest should also be reorganised with the deliberate object of establishing and developing of highly profitable industries in the country. Neglect of forest resources will mean poor standard of living, poverty and backwardness of our industries, and India cannot afford to neglect this green gold.

Appendix 1

State-wise Forests Area Lost For Various Purposes During the Period 1951-52 To 1972-73

States/U. Ts.	Forest area lost on account of					
	Total forest area	River valley projects	Agricultural purposes	Construction of roads etc.	Establishment of industries	Miscellaneous purposes
STATES						
1. Andhra Pradesh	163.6	21.9	120.8	—	8.2	6.7
2. Assam	66.6	19.7	14.2	6.6	0.9	25.2
3. Bihar	62.6	1.3	48.3	1.1	11.1	0.8
4. Gujarat	173.0	34.7	20.5	0.3	1.0	116.5
5. Haryana	0.1	—	—	—	—	—
6. Himachal Pradesh	21.1	7.6	6.7	1.1	—	5.7
7. Jammu & Kashmir	0.8	0.1	0.3	0.2	—	0.2
8. Karnataka	149.0	28.7	79.5	1.7	1.5	37.6
9. Kerala	115.0	7.8	94.6	0.2	12.1	0.3
10. Madhya Pradesh	1586.4	69.2	1453.3	0.4	24.8	38.7
11. Maharashtra	184.3	10.3	97.1	32.8	7.9	36.2
12. Manipur	—	—	—	—	—	—
13. Meghalaya	—	—	—	—	—	—
14. Nagaland	0.1	—	—	—	2.0	0.1
15. Orissa	91.4	32.5	8.3	0.8	24.0	25.8
16. Punjab	0.5	—	0.4	—	Neg.	0.1
17. Rajasthan	70.6	14.5	31.3	0.3	1.3	23.2
18. Sikkim	—	—	—	—	—	—
19. Tamil Nadu	60.1	45.1	2.2	0.1	0.3	12.4
20. Tripura	18.6	7.4	10.6	0.2	Neg.	0.4
21. Uttar Pradesh	215.5	93.2	79.7	3.4	19.3	19.9
22. West Bengal	321.8	1.3	313.4	1.9	2.9	2.3
Total state	3303.1	401.3	2381.2	51.1	117.4	352.1

UNION TERRITORIES

1. A. & N. Island	10.6	—	7.0	0.0	Neg.	3.1
2. Arunachal Pradesh	40.0	0.1	26.3	0.4	7.1	6.1
3. Dadra & Nagar Haveli	0.5	—	0.5	—	—	—
4. Delhi	0.1	—	—	0.1	—	Neg
5. Goa, Daman & Diu	21.1	—	17.4	2.7	—	1.0
6. Mizoram	—	—	—	—	—	—
7. Others	25.6	—	—	—	—	—
Total U. Ts.	97.9	0.1	51.3	3.6	7.1	35.8
Total All India	3401.0	401.4	2432.5	54.7	124.5	387.9
Percentage of total Forest area lost	100.0	11.8	71.5	1.6	3.7	11.4

Appendix 2

Classification of Area Under Forests

Description	1971-72	1973-74	1974-75
	In lakh Hectares		
1. From point of view of exploitation			
1. Exploitable	444	428	420
2. Potentially exploitable	161	178	181
3. Others	126	144	148
Total	731	750	749
2. By Legal Status :			
1. Reserved	354	381	391
2. Protected	247	242	239
3. Unclassified	110	127	119
Total	731	750	749
3. By Ownership :			
1. State	680	713	717
2. Corporate bodies	46	24	21
3. Private individuals	15	13	11
Total	731	750	749
4. By Composition :			
1. Coniferous	10	42	47
2. Non-Coniferous	721	708	702
Total	731	750	749

Appendix 3**Consumption of non-commercial fuel
(coal replacement million tons)**

Year	Dung	Firewood	Waste	Total	Per centage of total energy
1962-63	16.1	110.7	29.6	156.4	55
1963-64	16.4	113.3	28.8	159.5	
1964-65	17.2	117.3	30.0	164.5	
1965-66	17.6	120.1	30.2	167.9	
1966-67	18.0	123.0	30.4	171.4	
1967-68	18.5	124.4	30.6	173.5	52
1968-69	18.9	127.3	30.8	177.0	
1969-70	19.8	130.1	31.4	180.4	
1970-71	19.8	132.9	31.2	183.9	45
1980-81	21.0	163.0	46.0	230.0	30

Out-turn of Fuelwood during 1970-71

States/U.Ts.	Fuelwood production
All India	12,090
STATES	
Andhra Pradesh	739
Assam (including Mizoram)	200
Bihar	351
Gujarat	249
Haryana	47
Himachal Pradesh	135
Jammu & Kashmir	91
Karnataka	194
Kerala	850
Madhya Pradesh	2,647
Maharashtra	1,609
Manipur	53
Meghalaya	1
Nagaland	12
Orissa	1,436
Punjab	41
Rajasthan	228
Tamil Nadu	398
Tripura	27
Uttar Pradesh	2,478
West Bengal	197
Andaman & Nicobar Islands	33

Arunachal Pradesh	20
Delhi	@
Others	54
Total U. Ts.	107

@ Below 500 cu. metres

Appendix 4

Physical target and Achievements in Respect of Selected Forestry Schemes

Year	Plantation of quick growing species (000 hectares)	Economic Plantation for Industrial & Commercial uses (000 hectares)	Farm Forestry cum-fuel wood plantation (000 hectares)	Rehabilitation of degraded forest (000 hectares)	Communications (000 kms)
1966-67					
Target	46.3	56.4	23.5	20.1	2.18
Achievement	49.1	61.8	14.5	30.7	2.16
1967-68					
Target	59.3	54.5	10.9	22.2	1.27
Achievement	60.6	48.5	12.7	28.4	1.27
1968-69					
Target	61.5	53.8	14.5	37.2	1.69
Achievement	59.3	45.9	12.4	29.3	1.24
Fourth Plan					
1969-70					
Target	284.1	339.3	74.9	118.0	11.05
1969-70					
Achievements	46.0	46.5	9.8	26.5	0.87
1970-71					
Achievements	43.3	50.2	9.8	21.0	1.35
1971-72					
Achievements	45.2	55.1	10.9	20.7	1.73
1972-73					
Achievements	51.8	59.9	16.0	22.7	1.32
1973-74					
Achievements	65.7	76.3	18.0	N.A.	2.73
1969-74					
Targets	284.0	339.3	74.9	118.0	11.0
Achievements	232.8	291.2	63.0	127.3	8.7
Fifth Plan					
1974-79					
Targets	350.0	760.0	180.0	Not fixed	15.0

(Source : *Indian Agriculture in Brief*, 1976, p. 221 ; for 1977, p. 226.)

Appendix 5

Outturn and Value of Forest Produce, 1973-74

Quantity--Thousand cu. meters

Value--Thousand rupees

State	Timber		Fuel-wood		Total	
	Q	V	Q	V	Q	V
Andhra Pradesh	287	50,517	547	7,119	834	57,666
Assam	402	36,460	105	191	507	36,651
Bihar	376	28,054	314	10,228	690	38,282
Gujarat	136	54,307	237	5,747	373	60,054
H. P.	459	85,740	175	15,834	634	101,574
J & K	341	181,228	71	4,262	412	185,490
Karnataka	1,055	164,867	1,482	18,457	2,537	183,324
Kerala	565	—	872	—	1,437	101,974
M. P.	1,449	188,246	1,779	27,484	3,128	209,730
Maharashtra	377	110,739	1,913	45,383	2,290	156,122
Orissa	1,700	32,720	3,503	5,163	5,203	37,883
Punjab	50	6,557	41	2,088	91	8,645
Rajasthan	9	2,260	195	13,884	204	16,144
Tamil Nadu	31	39,045	320	10,791	351	49,836
U. P.	1,124	179,616	2,564	11,961	3,688	191,577
W. Bengal	337	31,001	700	10,769	1,037	41,770
Total India	1973-74	9,125	1,238	126	15,209	185,887
	1972-73	8,472	974,970	13,139	159,014	24,334
						1,529,535
						21,611
						1,234,652

(Indian Agriculture in Brief, 1977, pp. 132-183).

5.

Utilization of Land and Cropping Pattern

Land Resources

Land resources form the most important natural wealth of the country and their proper utilization is a matter of utmost concern to its people. The utilization of the land according to its use capability ensures that this resource is utilised to the best advantage. Its improper use leads to wastage and can lead to progressive deterioration and loss of productivity of this vital resource. It is the moral obligation of the present generation to pass this valuable resource on to future generations as nearly unimpaired and over-exploited as possible.

One of the most significant features of land use in India is the large proportion of area suitable for agriculture that already has been brought under cultivation. About 11 per cent of the surface area is made up of mountain land over 7,000 ft. in elevation, almost all of which is too steep or too cold for agriculture. Another 18 per cent of the surface is hill land between 1,000 and 7,000 ft. above sea level, three quarters of which is too steep to farm. Plateaus of relatively low relief, between 1,000 and 3,000 ft., form 28 per cent of all land in India, all but a quarter of which is topographically usable. In the low lands, less than 1,000 ft. in elevation, which make up 43 per cent of the total area in India, only one acre in 20 is unusable because of roughness of topography.

Topographically Usable Area in India (In million hectares)¹

Zone	Total Land Area	Topographical Moun- tains	Hills	Plateaus	forms Plains	Deduct unusable Area	Topogra- phically usable area
1. North India	29.4	3.2	1.7	1.4	23.1	5.8	23.6
2. East India	67.8	5.9	21.1	8.3	32.5	25.1	42.7
3. South India	43.5	0.2	11.3	11.6	20.5	12.5	31.0

1. *Census of India*, 1951, Vol. I Pt. I-A Report, 1952, p. 8.

4. Central India	74.9		13.5	45.5	16.0	22.3	52.7
5. West India	38.7	---	8.0	11.5	19.3	12.7	26.0
6. North West India	49.6	3.9	3.6	12.1	30.0	23.6	26.0
<hr/>							
Total India (incl : J. & K)	328.9	33.7	60.9	91.0	141.6	124.7	204.1

(N. B.—1. North India comprises U.P.

2. East India consists of Bihar, Orissa, West Bengal, Assam, Meghalaya, Tripura, Manipur, Nagaland, Mizoram.
3. South India includes Tamil Nadu, Karnataka, Kerala and Andhra Pradesh.
4. Central India refers to Madhya Pradesh.
5. West India includes Maharashtra and Gujarat.
6. N.W. India comprises Rajasthan, Punjab, Haryana, Jammu and Kashmir, Himachal Pradesh, and Delhi.)

Classification of Land

Classification of land is “a process which assigns each body or tract of land in an area to its proper class in a system of classes. The classes in the systems are defined in terms of the qualities or characteristics with which the classification is concerned.”¹ In India the classification of land has had its roots in agricultural statistics. Till 1950, the land in India was broadly classified into five categories: (i) Area under forests, (ii) Area not available for cultivation, (iii) uncultivated lands excluding current fallows ; (iv) Area under current fallows ; and (v) net area sown. But then it was realised that such a classification did not give a clear picture of the actual area under different categories of land use required for agricultural planning. Hence, a reclassification was adopted from March 1950. Under it, land in India is now classified under nine different categories, viz., (i) forests, (ii) barren and unculturable lands, (iii) land put to non-agricultural uses, (iv) culturable wastes, (v) permanent pastures and other grazing lands ; (vi) miscellaneous tree crops and groves not included in the net area sown ; (vii) current fallows ; (viii) other fallows ; and (ix) net area sown.

The total geographical area of India is 328.88 million hectares, but land use statistics are available for 304.1 m. hectares or 93.6 per cent of the total geographical area. The net area sown is 138.3 m. hectares (or 44.7 per cent) of which only 25.5 m. hectares or about

1. National Resources Planning Board, USA, *Land Classification in the United States*, 1941, p. 1.

8.1 per cent bear crop more than once. 52.8 per cent of the land area is under crops and fallow. It means that among large nations of the Orient, India is one of the best endowed with agricultural land. Wasteland, land under urban or village settlement, and land put to other non-agricultural uses comprise 14.3 per cent of the total area ; forest land makes up another 22.0 per cent. The remainder 10.9 per cent is made up of village pastures and grazing land, and firewood groves, jungle scrub and bamboo, private forests and culturable waste.¹

Classification of Area in India (per cent to the Reporting Area)

Land Use	1950-51	1955-56	1960-61	1965-66	1970-71	1971-72	1974-75
I. Geographical Area	—	—	328.77	million hectares		—	—
II. Reporting Area	284.32	291.92	298.46	305.55	305.84	306.22	306.15
(1) Forests	14.2	17.6	18.1	20.2	21.5	21.4	22.0
(2) Not available for cultivation (a + b)	16.7	16.6	17.0	16.2	14.6	15.2	14.3
(a) Area under non-agricultural land use	3.3	4.8	5.0	5.0	5.4	5.4	5.3
(b) Barren and unculturable land	13.4	11.8	12.0	11.2	9.2	9.8	9.0
(3) Other Uncultivated land excluding fallow land (a + b + c)	17.4	13.3	12.6	11.7	11.5	10.9	10.0
(a) Permanent pastures and grazing land	2.3	3.9	4.7	4.9	4.4	4.3	4.2
(b) Land under misc. Tree crops and groves not included in net area sown	7.0	2.0	1.5	1.3	1.4	1.4	1.5
(c) Culturable waste	8.1	7.4	6.4	5.5	5.7	5.2	5.2
(4) Fallow lands (a + b)	9.9	8.3	7.7	7.3	6.3	6.7	8.1
(a) Fallow Lands Other than current fallows	6.1	4.3	3.8	3.0	2.8	2.7	3.0
(b) Current fallows	3.8	4.0	3.9	4.3	3.5	4.0	5.1
(5) Net Area Sown	41.8	44.2	44.6	44.6	46.1	45.8	44.7

1. *Agricultural Situation in India*, August, 1974, p. 358 ; *Indian Agriculture in Brief*, 1976, pp. 34-31. *India*, 1977-78, p. 198.

Statistics of Land use by Regions

Regions	% of the total area				Per capita Cultivated Area	Other
	Under cultivation	Meadows and Pastures	Forests	Other area*	Hectares	
Far East						
(Incl. China)	18	13	23	46	0.24	0.61
Near East	7	17	11	65	0.61	6.07
Africa	9	23	26	42	1.05	5.02
Latin America	5	18	48	29	0.53	3.00
N. America	11	13	34	42	1.17	4.62
Europe	31	16	30	23	0.36	0.28
U. S. S. R.	10	17	39	34	1.05	3.64
Oceania	3	33	6	38	2.10	24.34
World	10	19	30	41	0.49	1.86
India	48	4	15	33	0.41	0.24

*Refers to unused but potentially productive and built on waste land areas and others.

Within the total geographical area, it is the arable land area which is of particular importance in an agricultural country like India. For all the countries of the world 32 per cent of the total geographical area falls under this category. The corresponding figure for India is larger at 46.2 per cent. In USSR, it is 27.4 per cent ; in USA 40.0 per cent ; in Canada 6.4 per cent and in Brazil 16.1 per cent respectively.

Further, on every hectare of arable land, India has to support 3 persons. The corresponding figure for the U. K. and West Germany is 7 ; for Belgium it is 11, for the Netherlands it is 14 and for Japan the figure is 17 ; i.e. about six times as large as that of India. Thus, while India is highly populated, the arable land available in relation to the population is much better than in countries like U.K., West Germany and Japan.¹

However, the per capita cultivable land available in India is only 0.27 hectares as against 0.90 hectares in U.S.A., 0.92 hectares in USSR, 1.01 hectares in Argentina, 1.95 hectares in Canada and 3.40 hectares in Australia.²

1. *Commerce Annual*, 1970, p. 11.

2. *Agriculture in Brief*, 1976, pp. 282-283.

There has been a tremendous increase in population with the result that not only the total land per capita but also the proportion of cultivated land per capita has been steadily shrinking in size. The per capita cultivated land went down from 1.09 acres (0.44 hectares) in 1921, to 1.04 acres (0.42 hectares) in 1931, to 0.94 acres (0.34 hectares) in 1941, to 0.84 acres (0.34 hectares) in 1951, to 0.74 acres (0.30 hectares) in 1961 ; and to 0.27 hectares in 1971. With this decline in the cultivated land per capita, the share of food and other produce of cultivation available to each individual is declining.

The population density per hectare of gross area sown varies considerably from 7.7 in Kerala, 5.7 in W. Bengal, 5 in Tamilnadu to 1.8 in M.P., 2.2 in Maharashtra, 2 in Punjab, 4.2 in Bihar, 3.5 in U.P., and 1.5 in Rajasthan, All-India average being 3. The population density per hectare of gross area sown is higher in about half the states than All-India basis. In Gujarat, M. P., Maharashtra, Karnataka, Punjab and Rajasthan the population density is lower than All-India average. Andhra Pradesh and Orissa have the same density as All-India.

If the cultivated area per capita is computed the situation remains similar. The cultivated area per capita varies from 0.14 hectares in West Bengal to 0.11 hectares in Kerala, 0.17 hectares in Assam, 0.21 hectares in U.P., 0.31 hectares in Orissa, 0.31 hectares in Punjab, 0.68 hectares in Rajasthan, 0.41 hectares each in Maharashtra and Karnataka, 0.19 hectares in Tamilnadu and 0.48 hectares in M.P.

With the increase in population the net area sown has increased, during the years 1950-51 to 1974-75 by about 31.9 million hectares i.e., the net cultivated area increased from 138.9 million hectares to 163.8 million hectares. This increase has been due to increased facilities of irrigation, reduction in fallow lands, and improved methods of cultivation, besides expansion in multiple cropping, use of better strains of seed and the reclamation of land for agricultural purposes. The following table shows trends in cultivated area :

Cultivated Area in millions of Hectares¹

Year	Gross Sown area	Net sown area	Double cropped area
1950-51	131.9	118.75	13.2
1955-56	147.3	129.16	18.1
1960-61	152.8	133.20	19.6
1965-66	155.27	137.24	21.11
1966-67	157.40	137.30	20.10
1967-68	163.65	139.85	23.80
1968-69	159.66	137.56	22.10

1. *Indian Agriculture in Brief*, 1974, p. 27 ; *India*, 1977-78, p. 198.

1969-70	163.70	138.70	25.08
1970-71	167.41	141.16	26.25
1971-72	164.00	189.36	24.64
1972-73	162.10	137.6	24.5
1973-74	169.5	142.7	26.8
1974-75	163.8	138.3	25.5

Cultivated Area

Cultivation in India is mostly confined to Tamilnadu, Gujarat, Maharashtra, W. Bengal, U.P., Punjab, Bihar, Orissa, M.P., Haryana and Kerala. About 14.3 per cent of the total cropped area of the country is in U.P. The second highest percentage of agricultural area is in Maharashtra (12.3 per cent) followed by M.P. (11.9 per cent) Rajasthan (9.6 per cent). Andhra Pradesh (8.3 per cent), Bihar (7.2 per cent), Karnataka (6.9 per cent), Punjab. (6.5 per cent), and Haryana (6.5 per cent), Gujarat (5.3 per cent), Tamilnadu (4.7 per cent), W. Bengal (4.2 per cent) and Assam (1.8 per cent). The percentage of sown area to total land area varies between different parts of the country and is mainly determined by physical condition of topography, soil and climate. The Indo-Gangetic plain and the coastal plains record the highest percentages, from 80 to 90, under cultivation. The proportion is substantially low in mountainous or arid regions i.e., 10 per cent or even lower. The states of West Bengal, Bihar, U.P. and Orissa together account for about 33 percent of the net area sown in the country though they form 27 per cent of the total land area. The proportion of sown area varies in these states between 70 and 89, and may be even higher if the hilly and mountainous sections are included.

With a rapid increase in population, the total percentage of cultivable area to the total reporting area has now reached the phenomenal figure of 81 per cent in Haryana to 56 per cent in Kerala. The respective percentage for other States are: Tamilnadu 47, Gujarat 51, Orissa 39, Punjab 81, W. Bengal 63, Bihar 49 and U.P. 58. Dr. Mukerjee speaking about the conditions in the Ganga valley observes that, the densities of cultivation and population in many districts of the Ganga plain are extraordinary... ..forest, meadows, and marshes all are now invaded by the plough due to population increase, which also leads to scarcity of fodder and grazing ground."¹

The proportion of cropped area to the total area in the States of peninsular India are much lower than in the plains and vary from 30 to 50 per cent. In M. P., Karnataka, Tamilnadu and Andhra Pradesh the percentage of cropped land is 41, 54, 47 and 43 respectively. In mountainous area and arid zones the acreage under crops is quite low, ranging from 10 to 20 per cent of the land area. For example, it is only 11 per cent in H. P., 16 per cent in J & K., 7 per cent Meghalaya and Nagaland each, and 8 per cent in Manipur.

1. R. K. Mukerjee, *Food Planning for 400 Millions*, 1938, pp. 7-8.

The percentage of sown area more than once is greater in these States than in most others, ranging from 22 per cent in Bihar to 23 per cent in W. Bengal and 24 per cent in U.P. and over 42 per cent in Punjab, when compared to the average of 11 per cent for the whole country. The significant fact brought about by the size of the total cultivated area is the low percentage of area sown more than once. The limiting factor is to be found in the deficiency of moisture and insufficient application of manures and fertilisers.

In North India and major parts of Southern India, main crop season is the rainy season when maize, millets, cotton, oilseeds, etc. are grown. Where monsoon crop is not taken, rabi crop is raised on the fallow land, the principal crops being wheat, rice, millets, barley, pulses, etc.

Double cropping is generally undertaken where water is available either through rains or by irrigation. In the eastern coastal regions, double cropping is made possible by the prevalence of suitable temperature and rainfall from the retreating monsoons. Area sown more than once has increased from 13.2 m. hectares in 1950-51 to 25.5 m. hectares in 1974-75, i.e. from 5.2 per cent of the reported area to 8.5 per cent.

Land not Available for Cultivation

Of the total geographical area, 40.2 m. hectares are not available for cultivation. Such areas consist of land put to non-agricultural uses and barren and unculturable waste. Of this hectrage, 34.8 per cent consists of the former and 65.2 per cent of the latter type of land.

Trends in Land Not Available for cultivation

Year	Area (m. hectares)	Year	Area (m. hectares)
1950-51	47.5	1969-70	46.1
1955-56	48.4	1970-71	44.7
1960-61	50.7	1971-72	46.4
1965-66	49.5	1972-73	41.8
1967-68	37.5	1973-74	41.2
1968-69	42.2	1974-75	40.6

Land put to non-agricultural uses stands for land occupied by buildings, roads, and railways, or under water e.g., rivers, canals and other lands put to uses other than agricultural. M.P. has 10 per cent of the total land put to non-agricultural uses. The percentages for U.P. are 12, Tamilnadu 17, Karnataka 12 and Orissa 13.

The barren land covers all barren and uncultivable lands like mountains, hills, deserts and hill slopes *i.e.*, all land which cannot be brought under cultivation except at a high cost is classed as uncultivable—whether such land lies in isolated blocks or within cultivated holdings. Large areas of such land exist in Assam (38 per cent of the State), Gujarat (30 per cent), Rajasthan (20 per cent), Orissa (18 per cent) and Manipur (64 per cent). But in Kerala, Tamilnadu, Karnataka and Maharashtra such areas are small.

It may be true that whole of this land may not be fit for cultivation or afforestation, but if trees of different types, suitable for different soils, are selected, a large proportion of these lands can be put under fuel and fodder trees, and pastures.

Other Un-cultivated Land

34.0 million hectares of land in India is returned under the heading "other uncultivated land excluding fallow land." Of this, 45.4 per cent (or 17 m. hectares) comprise of culturable waste; 39.7 per cent (or 12.9 m. hectares) of permanent pastures and other grazing lands and the rest 14.9 (*i.e.*, 4.1 m. hectares) is under miscellaneous tree crops and groves etc.

Trends in Other Uncultivated Land (m. hectares)

Year	Permanent pastures & Grazing Land	Land under misc. Tree groves	Culturable Waste	Total
1950-51	6.7	19.9	22.9	49.4
1955-56	11.5	5.9	91.5	38.9
1960-61	14.0	4.5	19.2	37.6
1965-66	14.8	4.0	17.0	35.8
1967-68	13.8	3.9	16.2	33.9
1968-69	13.5	3.9	16.1	33.5
1969-70	13.0	4.5	15.8	33.3
1970-71	13.0	4.3	15.2	32.5
1971-72	13.0	4.4	14.8	33.2
1972-73	12.7	4.6	17.4	34.7
1973-74	12.8	4.1	17.3	34.2
1974-75	12.9	4.1	17.0	34.0

Culturable Waste land includes all lands available for cultivation but not taken up for cultivation or abandoned after a few years for one reason or the other. Such land may be fallow for more than 5 years and may be covered with shrubs and jungles. They may be assessed or unassessed and may lie in isolated patches or blocks or within cultivated holdings. Land reserved for pastures are not included under this head.

Reh, bhur, usar and *khola* land of U. P. Haryana and Panjab and several other tracts are not cultivated due to soil deficiency or otherwise. About 25 per cent of the area in Goa, Daman and Diu and 18 per cent in Rajasthan are culturable waste. The area ranges from 9 per cent in Bihar to less than 1 per cent in Kerala, and Tripura and negligible in Manipur, Meghalaya Nagaland, W. Bengal etc.

Permanent Pastures and Other Grazing Lands cover all grazing lands whether permanent pastures and meadows or not, such as village common and grazing lands within forest areas and other uncultivated land. About 23 per cent of the area is under permanent pastures and grazing land in H. P. The proportion varies from 9 per cent to 5 per cent in Karnataka, M.P, Gujarat, Rajasthan, Orissa and Maharashtra.

Miscellaneous tree crops cover all cultivated land which is not included under 'net area sown' but is put to some agricultural use. Lands under casurina trees, bamboo bushes, thatching grass and other groves for fuel come under this category. The proportion of land under this category varies from 8 percent in Tripura to negligible in Gujarat, Meghalaya, Nagaland, Rajasthan, Haryana, Goa, Daman and Diu, U. P, Kerala, Assam, Orissa, and J. & K. have 2 to 7 per cent of the area under this category. In other States it is less than 2 per cent.

Thus, it should be noted that under culturable wasteland, neither the land for pastures and grazing is included nor that under miscellaneous tree crops. Wastelands for purposes of extension of cultivation can be found only from the categories "other uncultivated land excluding fallows"—which totals about 34.0 hectares.

The culturable wastelands if brought under cultivation, can be one of the important factors for augmenting the country's agricultural production. The chief reasons for leaving such lands uncultivated are : (1) deep rooted grasses and weeds, (2) unhealthy conditions chiefly due to malarial climate, (3) lack of drainage, (4) low fertility of the soil, (5) lack of water supply, (6) salinity and alkalinity and (7) damage by wild animals.

Besides, there exists a vast area which has gone out of cultivation due to ravages of soil erosion. Such land exists in the States of M. P., Rajasthan and Gujarat on the bank of Chambal, Mahe, Kali Sindh, Sabarmati; in the alluvial plains of Northern India (especially in U.P. and the Punjab). In all about 70 m. hectares of land requires protection of soil conservation measures.¹

The Wastelands Survey and Reclamation Committee has observed that the area of wasteland available for cultivation in blocks of 100 hectares or more (in the seven important states surveyed by

1. *Report on the Study on Wasteland including saline alkali and water-logged Land and their Reclamation Measures*, 1963, p. 5.

them) is reckoned at nearly 0.8 m hectares. These wastelands comprise of kans-infested wasteland saline and alkal lands water-logged land and eroded land.

Fallow Land

Such lands account for about 25.6 m. hectares, comprising 9.1 m. hectares of 'current fallows' and the remaining 16.5 m. hectares of 'fallows other than current fallows'. Current fallows are those lands which are not cultivated for one year and are given rest so that fertility could be restored. Other fallow lands include those lands which are left fallow for 1 to 5 years due to inadequate water supply, unfavourable climate, poverty of the cultivator and unremunerative nature of farming. Rajasthan and Tamilnadu have over 10 per cent of land under this category. It is between 4 to 10 per cent in states like A. P., Karnataka, Bihar, M.P., Maharashtra, Gujarat, U. P., West Bengal, Orissa, Assam, Haryana, Kerala and H. P. In others it is less than 4 per cent.

Trends in Fallow Lands (m. hectares)

Year	Current Fallows	Other Fallows	Total
1	2	3	4
1950-51	10.67	17.45	28.12
1955-56	11.58	12.54	24.12
1960-61	11.64	11.18	22.82
1965-66	13.18	9.21	22.39
1967-68	11.92	8.75	20.67
1968-69	14.10	9.04	23.14
1969-70	12.30	9.60	21.90
1970-71	10.59	8.63	19.22
1971-72	12.39	9.17	20.56
1972-73	15.2	9.3	24.5
1973-74	11.5	8.8	20.3
1974-75	16.5	8.8	25.6

Fallow lands may be reduced with the introduction of new crops, intelligent crop rotations, technical improvement on land and use of fertilizers and supply of irrigation facilities.

Areas Difficult for Cultivation

The areas where cultivation of land is difficult are :

(a) Eastern Maharashtra and the Madhya Pradesh where highlands are generally infertile excepting the black cotton soil areas (b) Assam's unhealthy climate in several districts as well as dense forests and mountains restrict cultivation to definite areas ; (c) The Himalaya, where mountainous nature of the land prevents large cultivation; (d) Rajasthan, an arid region where in the west due to Thar desert and in south due to hilly tract and lack of water supply

cultivation is extremely difficult ; (e) Orissa where malaria is highly prevalent; (f) Madhya Pradesh, large parts of which are infested with *kans* weed ; and (g) the whole country in the south between Western Ghats and the sea-ports from Goa to Cannanore, which though rich in commercial crops and enjoy good rainfall, is at present backward due to unhealthy climate, prevalence of malaria, inadequacy of communication and scarcity of labour. If these conditions can be improved, Malnad may contribute substantially towards raising agricultural production.

Besides, several million hectares of wasteland, which is either suffering from drainage problem, or have dense forests or are infested by malaria, exist in lower Bengal, northern strips of U.P. and Bihar and parts of Deccan.

It has been estimated that out of about 5 m. hectares of waste land, a third of the area is damaged by water-logging and soil salinity ; another third is affected by salinity and alkalinity with low sub-soil water table, and the balance of the area is threatened by the water-table rising to less than 25 cms from the surface. These require reclamation measures.

There can be no better evidence of the present backwardness of agricultural production in India than the fact that 9.1 m. hectares of land is returned as current fallow lands. This class of land comprises cropped areas which are kept fallow as a part of the normal crop rotation during the current year. The areas of current fallows range from 2 m. hectares each in Andhra to 1.2 m. hectares in Rajasthan and about 1 m. hectares in Tamil Nadu, Maharashtra and Karnataka. A subsistence type of production naturally involves a wastage of productive resources compelling the farmer to grow food in all kinds of soil as a mode of living and to attempt to conserve fertility of the soil by the practice of fallowing.

Possibilities of Extension of Cultivated Area

The total geographical area per capita in India comes to 2.2, acres (or 225 cents) as against 30 acres in USSR ; 12 acres in USA, 6 acres in Indonesia, 5 acres in China and 3 acres in France. Of the total per capita area, lots of areas are usable. On the basis of the Pearson and Harper's formula that 95 per cent of the mountains, 75 per cent of the hills, 25 per cent of the plateaus and 5 per cent of the plains are usable, only 1.51 acre per capita is left which can be termed as topographically usable. Or, in other words, only 4.3 ; 37.7 ; 168.6 and 293.7 m. acres—a total of 504 m. acres (out of 86.9 acres of mountains, 150.9 m. acres of hills, 224.8 acres of plateaus and 349.9 m. acres of plains) of land is topographically usable. Whole of this land is not fit for agriculture since it includes the sandy waste of Rajasthan dry area, Rann of Kutch and similar land in north western and western India (totalling about 45.5 m. acres). Excluding this type of area only 1.40 acre per capita is left which should be considered as topographically usable. Whole of

this area cannot be regarded as really arable because a considerable portion of it is under village and town sites, roads, and watercourses etc. Further, sandy soils are below the minimum degree of agricultural productivity. After making allowances of all these, only 0.97 acre per capita is left which can be regarded as arable.

Possibilities of extension seems to be not very bright. However it may be pointed out that the cultivated area is about 46.0 per cent of the total geographical area and 72.6 per cent of the maximum possible agricultural area. These ratios of cultivated area are lower than the corresponding All-India ratios in Assam ; M. P., Orissa, Rajasthan, and Himachal Pradesh. But in Punjab, W. Bengal, Maharashtra, Bihar and Delhi, the ratio of such area is very great ; while U. P., Andhra, Kerala, Tamilnadu and Karnataka stand in between where the maximum potentiality is between 20 and 25 per cent of the cultural area. This shows that the scope for extension is somewhat larger in some state and narrower in others. No doubt large areas in Sundarbans, Tarai, western Rajasthan and major parts of the Deccan have large areas of waste land available for cultivation but the main difficulty is that of drainage in some area, of dense forests in others and unhealthy climate in yet others, besides limitations of irrigation, soil and topography.

Several million hectares of land is infested by mosquitoes and malaria. This area can be made agriculturally fit by making it malaria-free. The rice growing areas in India are coincident with endemic malarial tracts and are uncultivated though fertile. Such tracts are : (i) a horizontal strip of the sub-Himalayan tract, *Tarai*, (ii) a vertical strip along the Eastern Ghats enlarging into a wide belt at the top merging into Tamilnadu, Orissa, M. P. and Andhra Pradesh.

In all these areas rice cultivation may be very profitable as the rainfall is between 75 cms. to 250 cms. per year. Malaria affects man but not the soil. Mosquitoes and rice plants are both sub-aquatic. One is aquatic fauna and the other is aquatic flora. They grow under the same conditions of high temperature, high humidity and heavy rainfall. It is possible to control mosquitoes and suppress malaria and to grow more rice to feed the country. Thus as a long-term programme and efforts should be made to increase the production of rice by controlling malaria.

The findings of the Wasteland, Survey and Reclamation Committee shows that only about 2 million acres of waste lands can be brought under cultivation and that too at a very prohibitive cost.

To sum up, it appears that about 50 per cent of the total geographical area is either under crops or is fallow. *Prima facie*, it may appear from this that it is possible, in due course, to extend cultivation over the other 50 per cent of the land. This is not so. Already about 20 per cent of the total geographical areas is under forests ; the need, in fact, is to extend this proportion to about 33 per

cent. About another 10 per cent would be taken up by human settlements, mines, railway lines, roads, rivers, mountains, etc. Therefore, while some expansion of the area under cultivation—say from 50 per cent to 60 p. c. of the geographical area—might be possible in the coming decades, the main emphasis would have to be on increasing the per hectare yields, i. e., reliance will have to be placed on intensification of agriculture and increasing productivity per hectare on the present cultivable area. Development of hybrid seeds and greater use of chemical fertilizers along with land improvement measures by reclamation of ravines, saline and arid lands, levelling and bunding by ensuring better drainage, by taking other measures of soil conservation and by improving the chemical and biological quality of soil.

Land Reclamation Schemes

These schemes are those schemes which are of multipurpose character and cover a wide range of activities. According to Pillai and Pannikar. "These are the schemes which provide not only for drainage and levelling of lands for cultivation or habitation but for linking up and co-ordinating these with the current of water courses, irrigation, road construction, organisation of communications, electricity undertakings, supply of drinking water, sanitation, housing establishment of rural centres, agricultural industries and multitude of other amenities. Thus, *land reclamation has come to be recognised not merely as a measure of land utilisation but as a complex policy contributing to over-all social and economic welfare*"¹. It is through land reclamation measures that culturable waste lands are brought under the plough.

The land covered with jungles and scrubs cannot be brought under cultivation without the aid of adequate labour and capital. The deep-rooted grasses like *kans* cannot be eradicated without the assistance of tractors, and the drawing of marshy lands is frequently an expensive operation. Provision of irrigational facilities involves heavy capital outlay and there is a limit to the rate at which open wells and tube-wells can be constructed. Lack of suitable fencing and fire-arms protection against wild animals also present difficulties in addition to these, unhealthy tracts provide problems difficult to tackle.

Land Reclamation Work Under the Plans

During the *First Plan* a total area of about 2.06 million acres was reclaimed by the Central and State Tractor Organisation and by private parties against a total target of about 2.87 m. acres in Rajasthan, U. P., Bihar, Andhra Pradesh and Tamil Nadu. During the *Second Plan* 1.7 m. acre were reclaimed by C. T. O. and 0.64 m. acres through manual labour.

1. V. R. Pillai and P. G. K. Pannikar, *Land Reclamation in Kerala*, 1965, p. 3.

During the *Third Plan* (under both State Government schemes and the Centrally sponsored scheme of reclamation of wastelands and resettlement of land) 4.2 m. acres of land was reclaimed.

In the *Fourth Plan*, reclamation of land was given a lower priority than quick-growing programmes like minor irrigation, high yielding variety, application of fertilizers, etc. Over 0.69 m. acre were reclaimed.

Schemes for reclamation and development of land in assured rainfall areas are now being implemented by the different State Government with financial assistance from Agricultural Refinance Corporation.

OPTIMAL LAND-USE PATTERN

We should have an optimal land use pattern which may remove the disequilibrium that has spoilt soil-plant-and water relationship through utilisation of marginal and other lands for grain cultivation bringing about tremendous loss of fertile soil in the watershed areas and silting-up of the river beds leading to severe floods. For securing optimal land-use pattern, the following line of action may be suggested :

- (1) New cropping patterns should be in agreement with the soil and water requirements of the area. Crops standing longer on the land and needing more water could be easily substituted by leguminous crops, forages, soyabeans etc. which are ready within a comparatively shorter period.
- (2) In the irrigation command areas of North and South India, water consuming crops like paddy and sugarcane ; crops like hybrid maize, hybrid jowar, groundnuts and oilseeds could be successfully planted.
- (3) Areas like West Bengal, Bihar, Orissa, eastern U.P., and Assam and the eastern coastal regions, which practise mono-culture, should resort to multi-cropping practice, where facilities of irrigation could be made use of. In areas producing jute, a combination of Jute-rice-wheat or maize may be adopted, followed by a variety of market gardening crops.
- (4) Dry-farming could be successfully undertaken in areas of low rainfall and with proper conservation of the available moisture, and reducing loss of moisture by evaporation through deep ploughing, and harrowing, crops like millets, pulses, oilseeds and forage crops may be raised. In such areas, drought-resistance varieties may be bred and cultivated. Sunflower may be successfully grown.
- (5) In arid and semi-arid regions, fast growing fuel trees may be planted along road, railway lines and along the canal

banks, and pastures raised so that live-stock farming could be a useful vocation for the local people.

- (6) Hill slopes in northern India may be developed with the cultivation of temperate fruits like peach, plum, apricot, apple, walnut, pears which are in great demand ; and in southern India banana, pineapple, mango, custard apple may be raised, besides growing a large number of vegetables like pea, cabbage, cauliflower, etc.
- (7) The hill areas in the north can also be utilised for mixed farming and raising of sheep and goat herds.

Changes in cropping pattern requires that certain basic conditions be fulfilled such as : (a) the collection of reliable information about soil and water resources, availability of necessary inputs like seeds, manures, manpower, technological advice, and other materials for optimal use of these resources. (b) Research on soil fertility, cropping pattern, water-use, and water management, dry farming techniques, soil conservation methods should be constantly pursued by the agriculture departments. (c) Land-use-plants for plains and hilly regions, salt-affected land, water-logged lands and dry areas need be properly drawn up by experts and communicated through demonstration projects, to the cultivators. (d) Necessary provision for the needed capital, either by way of loans, grants or subsidy be made available to the peasant when needed.

CROPPING PATTERN

'Crop pattern' means the proportion of area under different crops at a particular period of time. A change in cropping pattern means a change in the proportion under different crops.¹

Crop	Season	Duration
Rice	Winter	5 1/2 to 6 months
	Autumn	4 to 4 1/2 "
	Summer	2 to 3 "
Jowar	Kharif	4 1/2 to 5 "
	Rabi	4 1/2 to 5 "
	Zaid Kharif	2 1/2 "
Wheat	Rabi	5 to 5 1/2 "
Bajra	Kharif	4 1/2 "
Maize	Kharif	4 to 4 1/2 "
Ragi	Kharif	3 1/2 "
Barley	Rabi	5 to 5 1/2 "
Gram	Rabi	6 "
Sugarcane	Perennial	10 to 12 "

1. *Indian Agriculture in Brief*, 1976, pp. 63-64.

Sesamum	Kharif	3 1/2 to 4	months
	Rabi	5	"
Groundnut	Kharif early	4 to 4 1/2	"
	Kharif late	4 1/2 to 5	"
Rapeseed and mustard	Rabi	4 to 5	"
	Zaid Rabi	4	"
Linseed	Rabi	5 to 5 1/2	"
Castor	Kharif Early	6	"
	Others	8	"
Cotton	Kharif Early	6 to 7	"
	Kharif late	7 to 8	"
Tobacco	Kharif	7	"
Jute	Kharif	6 to 7	"

Factor Affecting the Cropping Pattern

Cropping pattern in agriculture is, among other things, ultimately governed by the farmers' cropping choices in individual farms. This implies decision making on the part of the farmers in favour of one or preference for one over other competing crops. These choices are directly governed by specific purposes for which the crops are to be grown and these are conditioned by geographical factors and modified by the emergent social and economic circumstances.

The choice for growing a particular crop in a particular region is an outcome of these factors : (i) the general agricultural conditions, particularly the soils, climate, water supply, and sub-soil water table, etc., (ii) aim of agricultural production, scale of production, size of holdings ; techniques of agriculture, and change in market prices.

In areas of scanty rainfall, where there is high uncertainty of Monsoons, there is to be found a greater dependence on millets, jowar, bajra, ragi etc. On the other hand, areas with assured rainfall or those having irrigation facilities, are devoted to rice, jute, sugarcane and tobacco. In water-logged areas of the Doab in Punjab and U. P., south-west coast of Andhra Pradesh or West Bengal, one comes across the paddy fields, but in newly reclaimed lands of M. P., and U. P., millets are first grown for a few years before they are shifted to rice.

Soils do affect the cropping pattern, through the plant nutrients available in them. Sandy soils are rather devoid of crops, but alluvial soils grow a large variety of crops ranging from wheat to rice, sugarcane, jute, tobacco. Black soil favours the cultivation of cotton and wheat ; while laterites attract coffee, rubber, cinchona, and tapioca plantations, etc.

The *size of the farm* also affects the cropping pattern. The small holders till recently used to devote only a smaller hectrage to cash crops than the larger holders. But the empirical studies like that in Deoria district of U. P., indicate that now all farmers do try to grow cash crops for these bring them more money. In fact, relative profitableness as governed generally by its suitability with reference to continuity of employment, comparative profits, and soil conservation and the particular effects of crops upon the soil fertility do influence the cropping pattern.

The *land tenures and land systems*, e. g., under the crop sharing system, the landlord has a dominant voice in the choice of the cropping pattern, and this helps in the adoption of income-maximising crop pattern adjustments.

Changes in the market prices, rent, interests, wages, etc., availability or otherwise of means of transport and the distance from the market also affect the cropping pattern. A study of the inter-crop price parities (made by the Ministry of Food and Agriculture) shows how price variation influences the hectrage shifts, "It seems that prices influence the hectrage under the crops in two ways. One is that the variations in the inter-crop price parities lead to shifts in hectrage as between the crops. Another is that the maintenance of a stable level of prices for a crop... provides a better incentive to the producer to increase the output than what a very high level of prices does, if there is no uncertainty of this level being maintained over a number of years."

Personal factors relating to the cultivator also influence cropping pattern. Under these are included the requirements for home and family consumption, meeting cash requirements of the family or for selling in the market, for meeting the feed and fodder needs of the year ; for maintaining soil fertility by sowing crops that follow in proper rotation or for green manuring ; for seed purposes and outside stimuli, i. e., under the influence of incentives, persuasion and propaganda made by the NES and other agencies and for minor factors (social and psychological and not clearly defined).

The *Government policy* also affects the cropping pattern. Policies relating to priorities given to various crops, exports, taxes, supply of credit, development of backward regions determine the nature of crops and the area under them.

New *technology* has also affected the change in the cropping pattern.

The following observations of a Scheme on *Factors influencing Cropping Patterns on Individual Holdings in Some States* (initiated by ICAR) will be found instructive :

1. Some crops require more water than others. The water requirements of gram, barley, bajra etc. are much lower than that

of rice, maize, cotton and sugarcane. While the former groups of crops can be successfully grown with a little rainfall, the latter will succeed only with sufficient irrigation or assured rainfall obtained frequently throughout the growing period of crops.

2. On irrigated area, the percentage area under food crops (chiefly rice, wheat, gram, maize) tends to decrease with the increase in the size of holding. The percentage area under fibre and cash crops increases with the increase in the size of holding.

3. Percentage area under food crops is higher under the crop-sharing than that of owned and cash-rented land.

4. Mechanised farming has a good impact on the cropping pattern. Grains and fodder crops occupy less area on the tractor cultivated holdings (54 per cent and 9 per cent in the Punjab) than those on the bullock-cultivated ones (58 per cent and 17 per cent) ; but cash crops claim more area on the former (30 per cent) than on the latter (18 per cent).

Another study undertaken by Dr. D. S. Chauhan in Bijnor Dist. of U. P. showed that in the villages surveyed (Saidpur and Hakikatpur) :

(i) the degree of commercialisation has been very high in villages nearer the factory areas, where there is a closely situated assured market for cane, oilseeds, and cotton ;

(ii) In spite of a sufficiently higher degree of commercialization the dominant character of agriculture remains to be that of subsistence type in which the pattern of farm production is determined by the pattern of family needs.

(iii) The degree of influence of feeds and fodders is also very high.

(iv) Outside stimuli have not been very effective as many of the measures were inadequate and delayed.

(v) The introduction of new crops is more difficult than the substitution of a new variety, since it is found that the farmers did not grow berseem for fodder with which they were not accustomed, but are relatively easily convinced to adopt new varieties of sugarcane and cotton.

CROPPING PATTERN IN INDIA

The outstanding features of the cropping pattern in India are :

- (i) the amazing variety of crops, and
- (ii) the preponderance of food over non-food crops.

Amazing Variety of Crops

The large extent of its area and a great variety of physical and natural features and climate combined with natural fertility of the

soil, enable the country to produce almost every kind of vegetable life. Herein one finds not only the tropical products but also the products of the temperate Zone as well. The most important among the *tropical products* grown here are : rice, coffee, sugarcane, jute, cinchona, spices, India rubber, pineapples, bananas, and other kinds of tropical fruits. The principal *sub-tropical* crops are cotton, opium and tea. Of the products of the *temperate climate*, the more important are : wheat, maize, barley, pulses, millets, potatoes, hemp and flax and various kinds of citrus and stone fruits. Besides these, many miscellaneous commodities are produced such as various kinds of oilseeds, gums, timber, indigo, etc. Thus, *the striking feature of Indian agriculture is its amazing variety.*

It would be interesting to note that in Eastern India, east of 80° east longitude, and in the coastal lowlands, specially the western coast south of Goa, rice is the predominant crop. Tea and jute are distinctive crops of East India. West of 80° east longitude and north of Surat (where rainfall is less than 100 cm), jowar, bajra, pulses, cotton and groundnut are the chief crops in the plateau ; and wheat, including pulses, gram, cotton, oilseeds, jawar, bajra and in irrigated tracts sugarcane, are all grown in the alluvial plains of Uttar Pradesh, Punjab and Haryana.

Preponderance of Food over Non-Food Crops

The other peculiar feature is that about three-fourths of the total cropped area is under food crops, as would be evident from the table given below.¹ In the absence of any capital improvement in the technique of cultivation large areas have been under these crops in order to cater to the food necessities of the teeming millions and a large-sized live-stock.

Food producing agriculture is strikingly concentrated upon three grain crops, viz., rice, millet, and wheat with some maize and barley. These between them occupy about 71 p. c. of the sown area. Pulses come next in area than oilseeds. The chief factor determining this crop distribution is the water supply. Rice, jute, tea and sugarcane require most water and are, therefore, grown in the regions of heavy rainfall, or as in the case of rice of adequate irrigation facilities. At the other extreme come the millets and short staple cotton which tolerate drier conditions than other crops and are grown in low rainfall regions. In between comes wheat, and often associated with it gram, also pulses and oilseeds, sugarcane and longstaple cotton—all require food but not excessive supply of water.

Of all these, rice is the most important crop occupying about 23 per cent of the total cropped area. About 7,000 varieties, wild and cultivated, occur in India in the middle and lower Ganga valley and the coastal strips. The rice belt runs through Assam, Meghalaya,

1. *India, 1971-72*, p. 242 and *Agricultural Situation in India, June 1974*, pp. 195-196, and for March, 1975, pp. 951-952 ; *India, 1977-78*, p. 20.

Area under Principal Crops (million hectares)

Crops	1950-51			1960-61			1965-66			1970-71			1976-77		
	Area	Area as % of the total cropped area	Area	Area as % of the total cropped area	Area	Area as % of the total cropped area	Area	Area as % of the total cropped area	Area	Area as % of the total cropped area	Area	Area as % of the total cropped area	Area	Area as % of the total cropped area	Area
Rice	30.81	23.30	34.12	22.43	35.27	22.77	37.59	22.6	38.06	22.7					
Jowar	15.57	11.80	18.41	12.10	17.50	11.30	17.37	10.4	15.77	10.2					
Wheat	9.75	7.40	12.97	8.52	12.65	8.17	18.24	11.0	20.56	11.4					
Bajra	9.02	6.80	11.49	7.53	11.56	7.46	12.91	7.9	10.73	8.8					
Gram	7.57	5.70	9.27	6.10	7.99	5.16	7.84	4.2	7.85	4.8					
Other Foodgrains Crops	24.60	18.70	29.35	19.22	28.20	18.20	26.95	14.7	33.78	18.6					
Total Foodgrains Crops	97.32	73.70	115.58	75.90	113.17	73.06	122.22	70.88	124.05	75.4					
Cotton	5.88	4.40	7.61	5.00	7.94	5.10	7.61	4.2	6.90	4.8					
Sugarcane	1.70	1.30	2.41	1.58	2.78	1.80	2.62	1.8	2.87	1.8					
Jute	0.57	0.43	0.63	0.42	0.75	0.48	0.75	0.3	0.73	0.3					
Tobacco	0.35	0.27	0.41	0.27	0.37	0.24	0.44	0.2	0.43	0.2					
Oilseeds	10.72	8.72	13.77	9.05	14.92	9.63	15.42	9.2	12.48	9.6					
Other non-food Crops	15.36	11.80	11.83	7.78	14.97	9.65	25.53	13.4	...	...			
Total non-food grains Crops	34.58	26.30	36.66	24.10	41.73	26.94	40.75	29.12	41.28	24.5					
Total Cropped Area	131.90	100.00	152.24	100.00	154.90	100.00	162.97	100.00	163.8	100.00					

West Bengal, Bihar, Orissa, Andhra Pradesh, Tamil Nadu and Kerala. The 'rationale' behind its importance could be traced to its comparable returns and consumer preference apart from climatic conditions. Some varieties are tolerant of dry conditions as barley : others can grow in water. Conforming fairly closely to the regional pattern of rice are such tropical crops as coconut, palmyra, areca palms and betelnut palms. A number of spices, the mango, the banana and other sub-tropical fruits will match this same pattern.

Next to rice, millets are the most common food, jowar, bajra, ragi, kodo, etc. are all most tolerant of drought and poverty and grown on poor soils in the hilly tracts in Deccan and the edges of north-west India. Rajasthan, Maharashtra, Gujarat and Karnataka have more than 45 per cent of the total area under these crops. The rationale of this dominance is explained by the fact that more than 60 per cent of the net cultivated area in India lacks irrigation facilities.

Wheat comes between rice and millets in its water requirements and does not tolerate high temperature. It is grown in areas where physio-climate conditions are suitable for its cultivation as in M. P., Gujarat, Maharashtra, Punjab, Haryana, northern Rajasthan, western U. P. etc. The stone fruits, apricots, peaches, pears, grapes, melons and walnuts belong to the wheat zone and are found in the north and in the mountain wall uplands.

It may be noted that though a substantial area also lies under tobacco, potatoes, fruits and vegetables, tea, coffee, rubber and coconuts but their share in the total cropped area is relatively small.

Appendix 2

The following table gives the position of sown area and the total output of foodgrain in India :¹

Area and Net Output of Foodgrains

(Area in million hectares : production in million tonnes)

	Cereals		Pulses		Foodgrains	
	Area	Output	Area	Output	Area	Output
1950-51	78.23	42.41	19.11	8.41	97.34	50.82
1955-56	87.34	55.80	23.22	11.05	110.56	66.85
1960-61	92.02	69.31	23.56	12.71	115.58	82.02
1969-70	101.55	87.81	21.52	11.69	123.57	99.05
1970-71	101.78	96.60	22.53	11.82	124.31	108.42
1971-72	100.50	93.60	22.17	11.05	122.69	104.65
1972-73	98.36	87.72	20.92	9.91	119.28	97.03
1973-74	103.25	93.86	22.88	9.75	126.13	103.61
1974-75	99.03	89.81	22.57	10.14	121.61	99.82
1975-76	103.72	107.99	24.45	130.39	128.81	121.03
1976-77	101.21	100.36	22.84	112.08	124.05	111.57

1. *India*, 1971-72, pp. 242 and 245 ; and *Agricultural Situation in India*, Vol. XXIX, No. 3 June, 1974, pp. 195-196 ; *Ibid.*, for March, 1975, p. 951.

It may be observed that the increase in acreage under foodgrains has been of the order of 24.0 p.c. between 1950-51 and 1976-77, whereas the output of foodgrains rose by 115.3 p.c. during the same period. In spite of this rather conspicuous increase in production, internal production falls short of requirement. This has been due to an unprecedented increase in the population of the country from 361 million in 1951 to 547 million in 1971. This situation has made the imports of cereals from abroad essential. However, since 1966, there has been noticed an appreciable fall in the quantity imported from 107.95 thousand tonnes in 1966 to 446 thousand tonnes in 1972. Since then, the imports increased due to severe floods and droughts which affected agricultural production. In 1974, the imports were of the order of 4,874 thousand tonnes ; 7497 thousand tonnes in 1975 ; and 6515 thousand tonnes in 1976. During 1977 (upto Sept), 492 thousand tonnes of cereals were imported.

Trends in Cropping Pattern

At the beginning of the present century, more than 83 p.c. of land was put under food-crops and about 17 p.c. on non-food crops. By 1944-45, area under food crops had come down to 80 p.c. and area under non-food crops had increased to 20 p.c. This shift in crops reflects a change from subsistence cropping to commercial cropping. Between 1950-51 and 1975-76, the total hectrage increased by about 20 per cent, the increase in non-food crops was much more than the increase in food crops. This is indicated by the following table :¹

**Changes in Area between 1950-51 to 1972-73
(1959-60 to 1961-62-100)**

Year	Foodgrains	Non-food grains	All Commodities
1950-51	83.2	77.2	82.2
1955-56	95.2	91.0	94.4
1960-61	99.4	98.4	99.2
1965-66	99.1	107.2	100.9
1969-70	106.4	105.6	106.2
1971-72	105.5	100.7	106.6
1972-73	101.1	103.7	101.6
1973-74	108.8	110.8	109.4
1974-75	104.6	109.4	105.8

¹This table gives only the broad changes in major crop categories.

II. Over 1950-51 period.

The highest increase has taken place in area under wheat (83 per cent) followed by maize (78 p.c.), while that under rice has been very small (22 p. c) in 1974-75. Compared to the food crops, the area under non-food crops has recorded appreciable increase—ranging from 51 p. c. each in case of oilseeds and plantation crops to 54 per cent in case of fibres and 80 per cent in case of sugarcane.

The increase under wheat, maize and rice may be accorded to the use of hybrid varieties of seeds, and other agricultural inputs, i. e., fertilizers, timely irrigation insecticides, pesticides and modern techniques for maximising output.

The following table gives the share of different crop categories in the total area sown.¹

	1950- 51	1955- 56	1960- 61	1965- 66	1970- 71	1976- 77
Total cereals	61.1	59.5	60.2	59.3	61.0	62.0
Total pulses	15.6	16.0	15.5	14.7	13.7	13.5
Total foodgrains	76.7	75.5	75.7	74.0	74.7	75.5
Sugarcane	1.5	1.3	1.6	1.8	1.6	1.7
Condiments	0.9	1.0	1.0	1.0	1.1	1.1
Total fruits	0.5	0.6	0.7	0.9	0.9	0.9
Potato	0.1	0.2	0.2	0.3	0.3	0.3
Total vegetables	1.1	0.9	1.0	1.2	1.3	1.4
Total oilseeds	8.3	8.1	8.4	9.1	8.1	8.2
Cotton	4.3	5.7	5.0	5.1	4.7	4.6
Jute	0.4	0.5	0.4	0.5	0.4	0.4
Other crops	6.3	6.4	6.2	6.4	6.8	6.4
Total cropped area	100.0	100.0	100.0	100.0	100.0	100.0

In a country like India which is dominated by farmers steeped in poverty and conservatism and with tiny holdings, cropping patterns can be made more rational through appropriate changes in economic motives. It should be a wise policy to emphasise on the increase in production of both foodgrains and cash crops rather than laying stress on any one crop.

The NCAER has made certain important suggestion for improving the cropping pattern. They may be summarised as below :²

Firstly, the present way of haphazard allocation of area to different crops by individual farmers is not in the best interests of the farmers or of the country. It is also a fact that the crop plans drawn

1. *Indian Agriculture in Brief*, 1976, pp. 32-33.

2. N. C. A. E. R. *Cropping Pattern Madhya Pradesh*, pp. 49-51.

out for different irrigation projects are not strictly adhered to, because individual farmers may not like to change their existing crop pattern either due to inertia or to ignorance, resulting in a wastage of capital, land and irrigation resources. As persuasion is slow remedy, it favours legislative compulsion (as in U.A.R. and USA) to bring about a desired cropping pattern in different areas.

Secondly, District Planning Officers may be appointed who could plan the crops for each season according to changes in the seasonal and other factors, like prices, yields, etc. The farmers should work in close cooperation with departments of agriculture, irrigation, etc. so that chalked-out programmes may be implemented.

Thirdly, an Agriculture Mechanisation Corporation should be set up where the size of holdings is too large and where the average farmer is unable to manage with hired labour. The Corporation should advance the farmers the requisite machinery.

Finally, the Governments should give the greatest importance to the promotion of transport and marketing facilities and consolidation of holdings.

Appendix 1

Classification of Area (Area-Thousand hectares)

	1950-51	1955-56	1960-61	1965-66	1970-71	1974-75
1. Area under forest	40,482	51,343	54,202	61,583	65,928	65,548
2. Area non available for cultivation	47,512	48,396	50,571	49,506	46,215	40,631
(i) Area under non Agriculture-uses	9,358	13,920	14,840	15,170	16,049	17,100
(ii) Barren and unculturable land	38,159	34,467	35,911	34,336	30,166	23,500
3. Other uncultivated land excluding fallow land	49,446	38,895	37,637	34,832	32,500	34,000
(i) Permanent pastures and other grazing land	6,675	11,473	13,966	14,828	12,996	12,900
(ii) Land under misc. tree grove not including in net area sown	19,828	5,805	4,459	4,038	4,339	4,110

(iii) Culturable waste	22,943	21,537	19,212	16,966	15,165	17,057
4. Fallow land	28,124	24,127	22,819	22,390	20,181	25,601
(i) Fallow land other than current fallows	17,445	12,544	11,180	9,207	9,027	9,116
(ii) Current fallows	10,679	11,583	11,639	13,183	11,109	16,492
5. Net area sown	118,746	129,156	133,199	136,242	141,161	138,334
6. Total reporting area†	284,315	291,917	298,458	305,553	305,985	304,139
7. Area for which no return exists	43,733	36,131	29,590	22,495	22,063	23,909
8. Total Geographical Area††	328,048	328,048	328,048	328,048	328,048	328,048

* Provisional

† Due to change in coverage the figures are not comparable from year to year and excludes information on area under the unlawful occupation of China and Pakistan.

†† Supplied by Central Statistical Organization according to Surveyor General of India.

Appendix 2

Production of Major Crops

Crops	Unit	1972-73	1973-74	1974-75	1975-76	1976-77
Rice	million tonnes	39.25	44.05	39.58	48.74	42.79
Wheat	"	24.74	21.78	24.10	28.85	29.08
Other cereals	"	23.13	28.82	26.13	30.40	28.49
Total Cereals	"	87.12	94.65	89.81	107.99	100.36
Gram	"	4.54	4.10	4.02	5.88	5.36
Total Pulses	"	9.91	10.01	10.02	13.04	11.21
Total foodgrains	"	97.03	104.66	99.83	127.03	111.57
Polato	"	4.45	4.86	6.23	7.31	7.29
Groundnut (in shell)	"	4.09	5.93	5.11	6.75	5.26
Total five Major oilseeds	"	6.86	8.85	8.53	9.91	7.83
Sugar cane (gur)	"	12.76	14.43	14.72	14.41	15.84
Cotton	Lakh bales of 170 kg. each.	57.35	63.09	71.56	59.50	57.81
Jute	Lakh bales 180 kg. each.	49.78	62.20	44.71	44.40	53.47
Mesta	Lakh bales 180 kg. each.	11.12	14.56	13.63	14.74	17.38

8.

Agriculture and Productivity Trends

Occupational Structure of the People

It is for a thousand years that India has been concerned with the rural economy and all through that time it has considered these four items, viz., agriculture, animal husbandry, trade or marketing and cottage industries or processing industries as pillars of rural economy not in any compartmental sense but in a co-ordinated sense. There is a dictum in *Bhagwad Gita* :

“कृषि, गोरक्षा, वाणिज्य, वैश्य कर्म स्वभावजम्”

Whether one may read the *Ramayana*, *Mahabharata* or *Puranas*, these have been continuously emphasising the co-ordinated development of these four pillars of rural economy. With the division amongst the people engaged in these four avocations, unfair rivalry and exploitation arose and every one was weakened and the feature of the Indian economic life has been that about two-third of its population is employed in agriculture.¹

A preponderant majority of India's work force is employed in the agricultural sector, as would be evidenced from the table given below :

Labour Force in India

1	Item 2	Census 1971 3	Census 1961 4
1.	Total working population (millions)	183.61	188.68
	(a) Males	148.79	129.21
	(b) Females	34.82	59.47
2.	No. of workers as % of total population	33.54	42.98
	(a) No. of male workers as % of total population	27.18	24.91

1. Percentage of population dependent on agriculture ranged from 65% in 1872 ; to 61.06% in 1891 ; 66.50% in 1931 ; 72.2% in 1911 ; 72.98 % in 1921 ; 67% in 1931 ; 75% in 1941 and 70% in 1951—*Census Report of India*, Vol. I, Pt. I, 1901, p. 439 ; *Ibid* for 1921, p. 284 ; *Ibid* for 1931, p. 313. *Ibid* for 1951, p. 39.

1	2	3	4
(b) No. of female workers as % of total population			
		6.36	13.57
3. % of male workers to male population		52.53	57.11
4. % of female workers to female population		13.18	27.95
5. Cultivators as % of total workers		42.87	52.78
6. Agricultural labourers as % of total workers		25.76	16.71
7. Other workers as % of total workers		31.37	30.51

According to 1971 census, India's working population was almost 184 million. Of this as much as 83 per cent was absorbed by the farm sector—42.8 per cent being engaged as cultivators and 25.7 per cent as agricultural labourers. The corresponding figures for 1961 census being 69.49%, 52.78% cultivators and 16.71 per cent agricultural labourers. The percentage of population dependent on agriculture in some selected countries are U.S.A. 9 ; UK, 6 ; USSR, 50 ; Japan 36 ; W. Germany, 10 ; France 20 ; China 70 ; and Turkey 70 as against 70 per cent in India. In other words, the proportion of persons engaged in agriculture has remained very high (between 1901 and 1971) and almost constant. In countries like U. K, USA, West Germany, Canada, etc, the people dependent on agriculture are less than 20 of the total population : in some cases less than 5 percent. With the growth of industries, in the advanced countries, this proportion is declining whereas in India it has remained more or less stationary. This would be clear from the following table.

Distribution of Workers in India¹

Category	1901	1911	1921	1931	1951	1961	1971
<i>Primary Section</i>	71.8	74.9	76.0	74.7	72.1	72.3	72.1
1. Cultivators	50.6	49.8	54.4	45.0	50.0	52.8	43.3
2. Agr. Labourers	16.9	20.6	17.4	24.8	19.7	16.7	26.3
3. Livestock, forestry, fishing, hunting, and plantation.	4.3	4.5	4.2	4.9	2.9	2.8	2.4
<i>Secondary Section</i>	12.6	11.1	10.4	10.2	10.6	11.7	11.2
<i>Tertiary Section</i>	15.6	14.0	13.6	15.1	17.3	16.0	16.7
Total Workers	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Predominance of Rural Population

India has been known as an agricultural country, 80 per cent of its population resides in the villages and only 20 per cent live in

1. B. R. Kalra, A note on the working Force Estimate, 1901-1961, *Final Population Tables*, paper No. 1, 1962 ; and *Pocket Book of Population Statistics*, 1972, p. 3.

the urban areas. These percentages for 1961 were : 82.02 and 17.98 ; for 1951 : 82.7 and 17.3 ; for 1941 : 86.1 and 13.9 ; for 1931 : 88.0 and 12 and for 1921 : 88.8 and 11.2 respectively. Out of 547.37 million people in 1971, 438.8 m. lived in rural areas and 109.1 m. in urban areas. In 1961, out of 439.2 million as many as 360.7 m. lived in rural areas and only 78.9 million in urban areas as against a total population of 361.1 million in 1951, of which 295.0 million resided in rural areas and 66.1 million in urban areas.

The percentage of people living in rural areas in *different* states was distributed as follows :—

Percentage of Rural Population to Total Population

	1971	1961	1951		1971	1961	1951
Andhra	80.7	72.6	72.6	Maharashtra	68.8	71.8	71.2
Assam	91.1	92.3	95.3	Karnataka	90.1	77.7	77.0
Bihar	90.0	91.6	93.2	Orissa	91.6	93.7	95.9
Gujarat	71.9	74.2	72.8	Punjab	76.3	79.9	81.0
J. & K.	81.4	83.3	N.A.	Rajasthan	82.3	83.7	81.5
Kerala	83.8	84.9	86.5	U.P.	85.9	87.1	86.4
M.P.	83.7	85.7	88.0	W.Bengal	75.2	75.5	76.1
Tamil Nadu	69.7	73.3	75.6	Union Territories	31.42	65.8	72.5*
					80.13	82.0†	82.7‡

* Excludes Goa, Daman, Diu, NEFA and Pondicherry.

† Excludes Goa, Daman and Diu.

‡ Excludes J&K, Goa, Daman, Diu, NEFA and Pondicherry.

Not all the population residing in the country is a working population. In 1931, out of a total population of 275.15 million the working force comprised of 122.49 million *i.e.* 40.30 per cent. In 1951, it was 142.32 million out of a population of 361.1 million *i.e.* it was only 39.10 per cent. According to the findings of 1961 census, out of a total population of 439.2 million, 188.57 million or 42.98 per cent was gainfully employed. In 1971, out of a total population of 547.9 million, 180.4 million or 32.8 per cent was gainfully employed.¹

1. This percentage of working population may be compared with 46.61% in 1901 ; 48.07% in 1911 and 46.92% in 1921—*Eastern Economist Annual*, 1965, p. 1323.

The figures of workers for 1971 and 1961 are not comparable due to definitional change.

In 1971, the total working population was 183.61 million or 33.54 per cent was gainfully employed. Sex-wise the strength of male labour force was about 149 m and constituted 27 per cent of the total population ; the female labour force was of the order of 35 million or just 6 per cent.

It should be noted that there is an apparent fall in the strength of the work force in 1971 as compared to 1961 because in the previous census a liberal definition of work was adopted.

According to 1971 census, the proportion of male workers to male population was 52.53 per cent but the percentage of female workers to female population was only 13.18.

Importance of Agriculture in National Economy

Agriculture forms the back-bone of Indian economy despite the concerted industrialisation during the plan period, agriculture still occupies a pride of place. The importance of agriculture arises from the following basic facts :

First, it is the most important sector of Indian economy, contributing (as per the National Income Committee and the Central Statistical Organisation) nearly half of the national income. Out of the total national income of Rs. 86.5 billion in 1948-49, output from agriculture was Rs. 42.5 billion or 49.1 per cent. In 1955-56, the respective data were Rs. 99.8 billion, Rs.45.2 billion or 47.9 per cent. In 1960-61, the data were Rs. 132.9 billion, Rs. 65.7 billion or 53.8 per cent. For 1971-72 these data were Rs. 194.8 billion, Rs. 85.8 billion or 47.3 per cent. In 1975-76, the total national income was Rs. 220.4 billion, and agriculture contributed to Rs. 94.2 billion or 42.8 per cent. Though agriculture has been the mainstay of Indian economy, yet the most distressing fact is that share of agriculture in national income has been declining steadily.

The contribution of agriculture to national income has varied from 65.0 per cent in 1914-18 to 57 per cent in 1925-29, to 53.0 per cent in 1930-31. Since then, the proportion has declined to 47.9 per cent in 1955-56, to 40.0 per cent in 1965-66. It showed a slight rise of 41.2 per cent in 1967-68 and 1968-69 and 44.8 per cent in 1969-70, when there were good crops. It again fell to 42.1 per cent in 1970-71 but rose to 47.3 per cent in 1971-72.

The relevant data are given in *Appendix 1* and *2* at the end of the chapter.

Contribution of Agriculture to National Income¹ (at 1960-61 Prices)

Year	National Income	National Income from agriculture	% Contribution of agriculture to total national income
	(In Crores of Rupees)		
1	2	3	4
1960-61	13,294	6,570	53.8
1965-66	15,234	6,667	40.0
1967-68	16,660	7,193	41.2
1968-69	17,057	7,165	41.2
1969-70	17,955	7,539	44.8
1970-71	19,282	8,752	42.1
1977-72	19,486	8,583	47.3
1972-73	19,235	7,985	42.1
1973-74	20,281	8,667	45.0
1974-75	20,281	8,359	40.0
1975-76	22,045	9,423	42.8

As against Indian agricultural contribution to national income, the proportion in U.K. is only 3.1 : in USA it is 3.2 : in Canada it is 5, in France 6 per cent in Japan 8.7 per cent and in Australia 7.6 per cent. The obvious conclusion is that *more developed a country, the smaller is the contribution of agriculture to national output.*

Second, agriculture dominates the country's economy to such an extent that 72.05 per cent of working population is dependent on agriculture, whereas in developed countries this ratio is very small, being only 50 per cent in UK, 4 per cent in USA and 16 per cent in Australia ; 14 per cent in France, 21 per cent in Japan, and 32 per cent in USSR. and it being high like India in the developing countries, viz., 58 per cent in Brazil, 64 per cent in Malaysia and 65 per cent in United Arab Republic. This high proportion in agriculture is due to the fact that alternative non-agricultural activities have not been developed to absorb the rapidly growing population in the country. This is an indication of the fact that *a high proportion of working population is engaged in agriculture only in underdeveloped and developing countries.*

Third, agriculture has been the source of raw materials to India's leading industries, cotton and jute textiles, sugar, tobacco, edible and non-edible oils, leather, plantation industries—all these depend on agriculture directly. Besides many others, processing, and preservation of fruits and vegetables, dal milling, rice husking, gur making, oil crushing and handloom weaving also draw on agri-

1. R.B.I. Report on Currency & Finance, Vol. II, 1976-77, p. 19.

culture for their raw material. According to the United Nations Survey (estimates in 1958) the industries with raw materials of agricultural origin accounted for 50 per cent of the value added and 64 per cent of all jobs in the industrial sector.

Fourth, agriculture employing about 70 per cent of the total populations provides a large part of the market for industrial goods, "To the extent that modern agricultural practices are adopted, the demand for inputs like seeds, fertilizers, pesticides, implements, machinery, pumps and consumer goods goes up and sustains a larger industrial tempo." It is worth noting that the development of Japanese and Russian industrial economies was made possible by the surplus of agriculture that could be siphoned off to the industrial sector. There is no reason why this could not be done in our own case.

Fifth, agriculture is the main support for railways, and roadways, which transport bulk of agricultural produce from farm to the mandies and factories. Internal trade is mostly in agricultural products. Besides, the finance of the Government, also depends, to the large extent, upon the prosperity of agriculture.

Sixth, agriculture provides a large proportion of India's traditional exports. Roughly, the proportion of agricultural goods contribute about 50 per cent of our total exports, manufactures with agricultural contents, about 20 per cent—making the total to 70 per cent of India's total exports. Exports earnings from agricultural products amounted to Rs. 334.9 crores in 1965-66 as against Rs. 281 crores in 1961-62. In 1969-70, it amounted to Rs. 49.3 crores and to Rs. 1,395 crores in 1974-75. The chief items of exports being tea, coffee, cashewnuts, spices, tobacco (raw and manufactured), raw hides and skins, raw jute, raw cotton, sugar, jute and cotton textiles, leather goods, oilcakes, vegetable oils, nuts and kernels, lac, gum, resin, etc. their imports bring the much needed for exchange for import of machinery, fertilisers and technical know how. (For share of agricultural commodities in total exports see Appendix 3).

Seventh, agriculture also provides fodder for livestock (35.33 crores) and poultry (11.5 crores). Cattle and buffaloes provide protective food in the form of milk, eggs and meat and they also provide drought power for farm operations and of commercial products like wool and hides.

Thus, it may be said that *agriculture is the backbone of Indian economy and prosperity of agriculture can also largely be responsible for the prosperity of the entire Indian economy.* Economic historians generally concur that there are no cases of successful development of a major country in which a rise in agricultural productivity did not precede or accompany industrial development. The Rostow stages—theory of growth has historically observed that agriculture plays a distinct but multiple and converging role in the transitional process of the 'take-off into self-sustained growth'. The operation

of planned development in India over the last 28 years bears witness to this fact. The performance of the last three Five Year Plans and 3 one-year Plans has clearly shown that the stimulation of a high but sustained rate of increase in per capita output in India (from Rs. 302 in 1960-61 to Rs. 346 in 1971-72, at 1961 prices,) is difficult to have with a strong development base in her agriculture.

It may, thus, be observed that agriculture occupies a major place in the dualistic set-up of the national economy. Its development operation has snow-ball effects over the whole of the economy. It constitutes the most important constraint on the process of growth because it conditions and determines the over-all rate of growth of the economy by supplying food for the population, by supplying some basic raw materials for expansion of certain consumer goods industries, by enlarging the demand for industrial output through an increase in agricultural income and through extending the capacity to absorb the monetary flow of Industrial investments, by employing a large pool of labour force, and by raising foreign exchange earnings through exports. It is unfortunate that Indian agriculture continues to be backward having multi-diversional facets.

Agricultural Production and Productivity Trends Prior to Independence

It may be pointed out that over the first half of this century (between 1901 and 1947), agricultural production declined. The population rose by 38%, but the cultivated area rose by 18% only, and the average annual output of foodgrains and pulses remained almost constant (101) but that of non-food crops increased by 53%. It was because of the increase in the latter that the index of all crop showed an increase of 18%.

Productivity Trends in Agriculture¹

Period	Index of Average Annual Output				
	Pop. Index	Cultivated Area Index	Food	Non-food	All crops
1900-01 to 1904-05	100	100	100	100	100
1940-41 to 1944-45	138	118	101	153	118

Dr. Panse made a special study of the yields of principal crops in India for the period between 1910-11 and 1945-46 and concluded that "the yield per acre of cereals did not show any consistent decline or increase but there was a positive increase in the yield per acre of commercial crops and foodgrains." He did not agree with the belief that there had been a deterioration in fertility or in the standards of agriculture.²

1. J. P. Bhattacharjee, *Studies in Indian Agricultural Economics*, 1948, p. 24.
2. *Agricultural Situation in India*, June, 1952.

Post-Independence Period

The process of decline in productivity has continued in the Post-Independence period, for as compared to the pre-1939 period, the average yield of cereals per acre during 1946-47 to 1949-50 had declined from 619 to 565 lbs.¹ Dr. Ragnekar found that the volume of output in India declined from 0.9 metric ton in 1938-39 to 0.86 metric ton per hectare in 1951.² Similar conclusions were reached by studies undertaken by the I.C.A.R. and the Grow More Food Enquiry Committee.

The decline in agricultural productivity has been reversed after 1949-50, partly because of the increase in area under cultivation, and partly because of the intensive methods of cultivation.

This is illustrated by the following table :³

Year	Index of foodgrains productivity	Index of non-foodgrains productivity	Index of productivity of all Com- modities
(Base 1959-60 to 1961-62=100)			
1950-51	79.1	93.5	83.2
1955-56	91.4	93.4	91.9
1960-61	102.8	104.2	103.3
1965-66	89.6	96.2	92.2
1969-70	116.3	106.5	112.7
1971-72	120.1	112.3	117.2
1972-73	113.1	106.2	110.6
1973-74	117.9	117.1	117.1
1974-75	115.4	115.6	115.5
1975-76	131.5	120.2	127.4

It will be observed that between 1950-51 and 1974-75, foodgrains productivity had increased by 41%, but the productivity of non-foodgrains has increased by about 19% only. The difference between foodgrains and non-foodgrains productivity is due to greater attention being given to the former. The over-all index of all agricultural productivity has however gone up 27% during the period. While agricultural productivity rose gradually since 1950-51, it received a serious jolt during 1965-66 and 1966-67 because of severe drought over vast areas of the country. The upward trend was renewed in 1967-68 and continued upto 1971-72. Then again a decline occurred due to severe droughts in many parts of the country.

1. *First Five Year Plan*, 1951, p. 155.

2. D. K. Ragnekar, *Poverty and Capital Development in India*, pp. 298-99.

3. *Indian Agriculture in Brief*, 1976, p. 136 ; for 1977, pp 142-143.

The following table gives the compound rates of growth of foodgrains since 1949-50 (in percentage) :¹

Period	Area	Yield	Production
1949-50 to 1959-60	1.90	1.30	3.30
1960-61 to 1974-75	0.44	1.20	2.00

During the first decade of planning, the new strategy of agriculture had not even been conceived but the second decade coincided with the introduction of new strategy to major food crops. During the first decade, production had increased at the annual rate of 3.3%. This was due to an increase in area and also increase in yield ; but the increase in area was much more, 1.9% as against 1.3% in increase on account of per acre yield. During the next 12 years, the rate of growth in the output declined to 2.26% per annum (from 3.3%) but the rate of growth in yield has increased by 47% over the previous period. But this order of increase in the yield was not sufficient to compensate for the fall in the rate of growth of area by 25%. The lower rate of growth in output of foodgrains during the last 12 years (2.2%) coincided with three drought years (1965-66, 1966-67 and 1972-73). The Fourth Plan target of growth rate of foodgrains was 5.6% but the actual achievement was of the order of about 3.4 per cent only.

PROBLEMS OF LOW YIELDS

India *leads* all other countries in the production of ground-nuts and tea and *enjoys a monopoly* in the production of lac. She is the *second largest producer* of rice, raw jute, sugar, rape-seed, sesamum, cotton and castorseed ; and it *ranks third* in the production of millets. Though India compares favourably with other countries of the world in agricultural production, her position is not very satisfactory in so far as the yield of crops per hectare is concerned. It is this low yield which made Dr. Clouston to remark, about 50 years ago, that "India has depressed classes, she too has depressed industries and unfortunately agriculture is one of them." This remark still holds true. Yields per hectare in India are comparatively low and these too are reduced to nothing in the periods of drought. The Ford Foundation Team has reported that, "the best in Indian agriculture is comparable to the best in other countries but the average is unduly low. The task before the country is to develop ways of raising the low average to higher levels which many cultivators have achieved."

Yield of Major Crops in Selected Countries (in 1974 in quintals per hectare)².

1. *Ibid.* p. 139.

2. *Indian Agriculture in Brief*, 1976, pp. 289-293.

- Wheat** ; *India* 13.1 ; U. S. A. 22.8 ; Canada 18.7 ; Netherlands 40.4 ; Denmark 41.6 ; Argentina 14.3 ; U.S.S.R. 14.4 ; France 38.6 ; Italy 26.1 ; Turkey 14.0 ; Australia 12.7 ; Asia 8.7 ; *World* 14.2.
- Rice (Paddy)** : *India* 17.1 ; Japan 58.3 ; Burma 16.9 ; U.S.A. 52.0 ; Thailand 19.7 ; United Arab Republic 54.4 ; Indonesia 26.8 ; U.S.S.R. 38.2 ; Brazil 15.5 ; Pakistan 20.9 ; Asia 17.3 ; *World* 20.0.
- Sugarcane** : *India* 511.6 ; Cuba 422.0 ; Hawaii 1963.1 ; Puerto Rico 657.0 ; Indonesia 725.0 ; Brazil 475.0 ; Australia 796.9.
- Tobacco** : *India* 10.0 ; Japan 23.1 ; Brazil 10.0 ; U.S.A. 22.8 ; Pakistan 14.9 ; Canada 23.3 ; Italy 15.0 ; U.S.S.R. 16.5 ; Japan 23.1 ; *World* 11.3.
- Cotton (Lint)** : *India* 1.5 ; U.S.A. 4.9 ; United Arab Republic 7.8 ; Sudan 4.6 ; Pakistan 2.8 ; Uganda 1.1 ; U.S.S.R. 8.4 ; China 3.0 ; *World* 3.4.
- Groundnut** : *India* 8.2 ; Indonesia 11.7 ; U.S.A. 22.9 ; Argentina 12.5 ; Japan 19.5 ; U. A. R. 202 ; Senegal 9.5 ; *World* 9.0.
- Maize** : *India* 90 ; U.S.A. 54.5 ; France 46.5 ; U.A.R. 41.1 ; Argentina 28.4 ; U. S. S. R. 30.7 ; *World* 20.0.
- Potatoes** : *India* 75 ; U. S. A. 20.7 ; U.S.S.R. 92 ; Canada 160 ; France 169 ; Japan 174 ; Asia 961 ; *World* 112.6.
- Barley** : *India* 8 ; U. A. R. 26.3 ; U. S. A. 18.9 ; France 29 ; W. Germany 31.1 ; Belgium 35.8 ; Netherlands 38.4 ; New Zealand 30.3 ; *World* 14.4.

Broadly speaking, in case of certain crops yield per hectare in India is about one-third and one-fourth and in case of others about one-half to one-third of the yield prevailing in selected countries of the world. "The world average of wheat yield per hectare is 50% higher than Indian yield. For other crops world average yield for rice is 60% higher, millets 80 per cent higher, potatoes 60 per cent higher, maize 140 per cent higher and cotton 250 per cent higher than Indian rate of yields."

Analysis of comparative yield data brings out two important features. *One*, that agricultural productivity (i. e., per hectare) is miserably low in India, as compared to other countries, in nearly all crops. *Second*, over the last few years average productivity per acre has been increasing, due to increasing use of hybrid, high yielding varieties of seeds, greater application of chemical fertilizers, launching of land improvement programmes, and increasing availability of irrigation facilities, followed by scientific methods of farming and cultivation.

Yield per hectare of Principal Crops in India¹
(in kgs. per hectare)

Crop	1968-69	1969-70	1970-71	1971-72	1972-73	1973-74	1975-76
Cereals : Rice	1,076	1,073	1,123	1,145	1,073	1,151	1,246
Maize	997	968	1,279	892	1,084	965	1,173
Wheat	1,169	1,209	1,307	1,382	1,254	1,172	1,409
Barley	879	982	1,090	1,028	967	895	1,125
<i>Total cereals</i>	843	865	949	936	883	918	1,040
Pulses : Gram	607	715	663	636	651	528	709
Tur	718	690	709	718	795	532	785
<i>Total pulses</i>	369	371	393	364	299	346	533
Oilseeds : Groundnut	653	720	834	789	585	845	948
Rape & Mustard	469	493	594	404	585	493	557
Fibres : Cotton	122	122	106	151	128	142	139
Jute	1,002	1,326	1,186	1,256	1,280	1,412	1,369
Mesta	583	633	684	684	684	708	783
Miscellaneous :							
Tobacco	821	770	810	920	838	1,001	940
Rubber	576	616	653	678	725	756	772
Tea	1,146	1,114	1,191	1,215	1,255	1,311	1,357

Land productivity shows marked regional variations. The average works out to be Rs. 1037 per hectare of the country as a whole. It ranges between as high as Rs. 2,716 in Kerala to as low as Rs. 461 in Rajasthan. This low productivity may be contributed to differences in soil fertility, availability of water supply, supply of infra-structure facilities and governments' plans to improve agricultural inputs.

Agricultural Productivity Land (Average for 1967-68 to 1969-70)²

State	Net Average per hectare (Rs.)	State	Net Average per hectare (Rs.)
Kerala	2,716	Nagaland	1,702
W. Bengal	2,223	U.P.	1,447
Assam	2,102	Tamil Nadu	1,367
H.P.	1,876	Haryana	1,367
Punjab	1,859	Bihar	1,247
J & K	1,124	Orissa	1,155
All India	1,037	Andhra Pradesh	1,058
Karnataka	834	Gujarat	774
Maharashtra	583	M.P.	539
		Rajasthan	461

1. *Indian Agriculture in Brief*, 1974, pp. 71-73 ; and for 1976, pp. 89-91 ; for 1977, pp.93-95.

2. *Commerce Annual Number*, 1972, p.14.

Consequences of Low Yields

Low yields of crops has been the basic cause of the severity of food problem since 1942. Millions of countrymen still suffer all their lives from mal- and under-nutrition as a wide gap exists between the nutritional requirements and the actual availability of food. About 30 per cent of people do not get enough food to eat even in normal times. The shortfall of foodgrains has been variously estimated from as low as 3 to 4 m. tonnes to as high as 11 to 14 m. tonnes with 7 to 8 m. tonnes as being the more commonly accepted estimate.

The low level of production of cash crops means, in general, low level of purchasing power of the peasant masses. This in turn produces several severe consequences : (i) the home market for industrial goods shrinks; (ii) industrial decay produces unemployment for the workers and the middle class people ; and (iii) the burden of rent, interest and taxes grows to such an extent that rural economy cracks up, domination of the money lender grows over the peasantry, the peasants are forced to sell their land and it gets concentrated in the hands of the parasitic class. This in turn reduces the productivity of the soil.

LABOUR PRODUCTIVITY IN AGRICULTURE

Output per worker in agriculture is also low. Labour productivity is Rs. 1213, on the average for India as a whole, it being Rs. 3,195 in Punjab and Rs. 409 in Nagaland. This is indicated in the table given below :

Agricultural Productivity per worker¹
(Average for 1967-68 to 1969-70)

State	Average net output per worker at current prices (Rs.)
Punjab	3,195
Haryana	2,922
Kerala	2,072
West Bengal	1,819
Assam	1,707
Gujarat	1,457
Orissa	1,400
Jammu & Kashmir	1,393
Karnataka	1,321
U.P.	1,236
<i>All India Average</i>	1,213

1. *Commerce Annual Number*, 1972, p. 14.

State	Average net output per worker at current prices (Rs.)
Himachal Pradesh	1,134
Rajasthan	1,129
Andhra Pradesh	993
Tamil Nadu	955
Maharashtra	949
M.P.	856
Bihar	755
Nagaland	409

In India average productivity per man per year in agriculture is the lowest as would be clear from the following data : (In U.S. Dollars),¹

W. Germany	3,495	Canada	2,126
New Zealand	3,481	U.K.	2,057
Austria	2,442	Australia	1,233
U.S.A.	2,408	Norway	973
Japan	2,265	India	105

In other words, it may be said that India's agricultural productivity per person engaged in agriculture, is a little more than one-thirty-fourth of that of New Zealand and W. Germany, and less than one-twentieth of U.K., one-twenty-fourth of U. S.A. and one-twenty-second of Japan.

Stagnation in agricultural productivity has resulted in the wake of soaring prices of agricultural produce, disapproving many theories of price production complexes or relationships ; imperfect food distribution.

One significant reason for low productivity per worker is the employment of too many people in agriculture than what is actually needed. In some countries of the world only a fifth of the population produces a diet that gives a person some 8,000 calories a day *i.e.*, a family adequately feeds five families; while in India one farm family cannot support itself properly and needs help of another family. It has been estimated that in 1860, a farm worker in U.S.A. supplied only four others with farm products. In 1900, he was supplying 6. By 1961, he supplied food and fibre to 22 other fellow citizens and also to four others abroad, a total of 26. Putting it another way in 1960, there were about 6 million people doing farm work and feeding a national population of about 31 millions. Today 7 million farm workers supply food and fibre to 188 million Ameri-

1. Baliit Singh, *Next Step in Village India*, p. 42.

cans and enables the States to be the world's largest exporter of farm products. When U. S. A. was discovered 9 out of 10 lived on farms. To-day less than 1 out of 10 lives on farms. Less than 10 per cent of U. S. A. workers are needed to feed them, compared with 45 per cent in U. S. S. R., 25 per cent in France, 70 per cent in India. Mechanization, fertilizer and improved breeds have made it possible for man on the U.S. farm to produce about 8 times as much per hour as a farm worker of 100 years ago.¹ It may be noted that all this progress either in U.S.A., or U.S.S.R. has not been attained through the waving of a magic wand. It has been brought by sustained application of science and technology to agriculture. It means better education of the farmer, carrying the results of research from laboratories to the farm, soil analysis, use of appropriate chemical fertilisers and manures on a sustained basis, introduction of improved varieties and types of crops and livestock, better feeds for poultry and livestock and use of pesticides for controlling weeds, insects and diseases. Irrigation and drainage were no less important. In Japan, inspite of her small holding application of science and technology has been responsible for increasing agricultural production. Similar has been the case in U. S. S. R. where extensive chemicalisation has worked a veritable revolution in agricultural production. It has paved the way to an unprecedented enhancement of crop yield, livestock productivity and labour productivity. The trebling and quadrupling of the yield in Mexico and the countries of North-West Europe was achieved with the help of mechanization, chemicalisation and universal irrigation in a mere few year's time.² Unfortunately in India, the state of affairs is yet very unsatisfactory but if agricultural inputs are properly supplied they can increase our yields manifold.

CAUSES FOR LOW PRODUCTIVITY

Though there has been some improvement in recent years, the conditions in agriculture have not changed much and are almost the same what they were about 2 decades back. The rate of soil exhaustion, which takes place in the normal process of agriculture, is not being replenished through natural and artificial methods. And there has been a fall or decline from the low level of fertility or productivity where it was believed to have stabilized. The fear of decline is greater now and is likely to be still more in future because in increasing production quickly, the possibilities are there of exploiting the land resources ignoring the ideas of natural balance and thus damaging or impairing its inherent productive capacity.

In the words of Dr. Chauhan, "the decline takes place in many forms depending upon the location and quality (soil and

1. Freeman, O. L., "The American Farm Revolution," in *American Review* January 1964, pp. 82-84.
2. M. Syrstov, "Components of Crop Yields," in the *Soviet Land*, No.5 March 1963, p. 7.

topography) of the particular piece of land, climate conditions of the particular locality, and the nature and intensity of agricultural activity. It manifests itself in the form of fertile and cultivated land going out of cultivation as it is turned into uncultivable waste; development of aridity, salinity, and alkalinity ravine formation, decline in crop yields, changes in cropping patterns, shrinkage in the extent of double cropping and the resulting decline in crop intensity, decline of water table and the vegetative cover becoming scanty and stunted, etc. All the forms do not exhibit themselves, everywhere or at the same place at one particular time. The rate of decline also varies from place to place. *The declining trends in productivity of land should be taken as the signals of slowly coming dangers*".

The factors responsible for the backwardness of agriculture, and therefore, for low yields are :

(1) Our land resources were never taxed to such an extent as they are now because of overcrowding and consequently the cultivated land per capita has been reduced from 1.09 acre in 1891 to 1.11 acres in 1921, 1.04 acres in 1931 and to 0.94 acre in 1941 and to 0.75 acre in 1961 and to 0.73 acres in 1971. Not much can be achieved unless this continuing pressure of population on land is reduced and used as a source of capital formation. Attempts to substitute heavy yielding crops and varieties have accelerated the strain and in the absence of any adequate manuring, the soil has lost its fertility.

(2) Reckless deforestation has led to declining flora so that less humus is being added to the soil through normal process. Humus deficiency is resulting in the increasing of temperature ; and it is making the pre-monsoon cropping more and more difficult. This deficiency causing reduction in the capacity of retention of moisture seem to be responsible for reducing the capacity of soils to withstand the effectiveness of some agricultural hazards and thus increasing the losses in output and ultimately resulting in the decline of average productivity.

(3) The serious drainage problem, caused by the increased construction of roads, railways and canals, has disturbed the natural drainage system by checking the normal flow of rain water and bringing heavy floods. This results in large scale damage to *kharif* and considerable late sowing of *rabi* crops.

(4) Marginal and sub-marginal lands are being brought under cultivation, due to increasing population pressure, and such lands are generally inferior and yield less, and thus bring about a decline in the average productivity.

(5) As a consequence of recent land reforms, land is passing (by purchase, lease or allotment) to classes which have no agricultural traditions and in most of the cases they lack the necessary

technical knowledge and, therefore, they are inefficient farmers. Even the agricultural labourers who take to self-cultivation, ignorance of soil conditions and of their suitability to specific crops, of the timings of land, and skill for performing some operations, are bound to become inferior farmers and such lands are under-cultivated. Besides, the tiller has to pay heavy rents for the land he cultivates and he has no security of tenure. Under these difficult situations, it is impossible to expect the tiller to increase agricultural productivity.

(6) With the depletion of forest resources, fuel supply is becoming scarcer and hence more of cowdung is being burnt, and lesser and lesser quantity of it goes to the field.¹ Moreover, due to a small number of superior cattle, the supply of cowdung is also declining. Thus, the most important source of manure is gradually being lost.

(7) Crop-rotations and practice of fallowing are getting disturbed because of the pressure of population for more food and raw materials.

(8) Soil erosion is constantly increasing and in the eroded regions the fertile and the cultivated land is going out of cultivation and is turning into a barren waste. Cropping patterns are changing in which superior crops are giving place to inferior ones, and crop yields are also declining.

(9) Rapid increase in construction work, because of scarcity of cement and steel, depends upon bricks, which spoils generally the cultivated land. This is manifest mostly in the surrounding of cities where brick-kilns abound.

(10) Large areas have gone out of cultivation because of growing salinity, aridity, alkalinity and semi-desert conditions. There are at least 2m. acres of wasteland in blocks of 250 acres or more which need reclamation.

(11) The density of population depending upon agriculture also has a direct bearing on the unit yield of the region. The yields of cereals are lower in more purely agricultural countries than in more industrialised countries because excessive pressure results in disproportionate utilisation of land for cereals unsatisfactory system of crop rotation and less possibility of recuperation of the soil.

(12) The subsistence type of farming results in deficit agricultural economy. Agriculture remains 'low-income occupation', which follows savings, low investment and low agricultural incomes. This

1. "The amount of cattle dung annually available is 1200 m. tonnes (wet, weight) of which 400 m. tonnes are used as fuel and 215 m. tonnes as manure the balance is being wasted."—Planning Committee, *Natural Resources of India*, 1963, p. 15.

poverty has created a vicious circle which starts with and ends in low agricultural production. *Low production leads to low marketable surplus, low bargaining power, low incomes, low investment for land improvement and ultimately ends in low agricultural production.* Thus, low production leads to poverty. Each factor tends to react upon the other in such a way as to keep the vicious circle of poverty intact.

(13) Indian agriculture is "a gamble in monsoon". Agricultural production function in India is highly responsive to the uncertainty of rainfall. Risks arising out of natural factors such as hailstorm, unfavourable weather conditions—insufficient rains or badly distributed rainfall, frosts, diseases or insects—excessive rains, droughts, floods etc., all exert a very unfavourable influence on agriculture. Monsoons are irregular, ill-distributed and uncertain. They also set in too early or too late. The inevitable result is failure of crops. So far only 20 per cent of the area is irrigated. Continued absence of adequate facilities for 80 per cent of the area for irrigation have made the poor cultivator a helpless tool in the hands of his 'fate'. It has been rightly said, "farm production cannot be quickly expanded or contracted but may be seriously and unexpectedly reduced by bad weather, pests and diseases."¹

(14) The poor equipment, inadequacy and obsolete nature of tools has been a contributory factor. The prices of new implements and equipments are unreasonably high and beyond the reach of majority of small and medium cultivators. Further, the wide variation in the prices of their different makes lead to a lack of confidence and hampers the cultivators to make use of them.

(15) Agriculture in India lacks in organisation and leadership. It has never offered phenomenal prosperity to anybody like an industry. The philosophy attached to it is a way of life retarded entry of the talent into its fold. Inclemencies of weather, vagaries of monsoon, fluctuating prices, outmoded tools and implements, bad rural living conditions, harassment by village factions and petty officials etc. have made agriculture and rural living unattractive to the talented youth. The result is a heavy erosion of the resourceful talent from agriculture and this considerably reduces the capacity of the farming community to compete and progress.

(16) Low output of research is also one of the causes of the failure in our agriculture. In the last 20 years, research has in many cases reached only general conclusions and very often the research results are neither in a usable form nor have reached the cultivators. Extension is confined to individual good practices and no complete pattern of farming has been advocated. It is so because the support given to agricultural and biological research has been extremely meagre so far.

1. W. Lawrence, and Ezekial, M., *The Farm and The City*, 1953, p. 1.

Other factors responsible for low yields are :

(17) Small size of a large number of holdings—about 62.96 per cent of households cultivate less than 5 acres – or a large number of uneconomic holdings of cultivable land which are also fragmented and subdivided. This makes difficult appropriate investment for modernisation of cultivation methods.

(18) Land concentration in a few hands, the owners of which do not utilise it to the fullest extent and below them are large number of medium and small cultivators. Rigid and oppressive land system and high rates of rent discourage investment for permanent improvements in land.

(19) Restricted storage facilities for holding the produce which depresses unduly the price in the market; and bad communications and imperfect marketing facilities prevent realisation of a fair price for the produce. This situation does not induce the cultivator to produce more.

(20) Lack of adequate non-farm services like provision of cheap credit and the resultant indebtedness and poverty of the peasant and lack of marketing facilities hinder improvement in techniques of production.

(21) Indian society is a faction-ridden society. The case studies reveal “a far greater role of the caste’s negative functions in terms of constant breaks in village solidarity and any spirit of co-operation, promotion of insecurity, and acts of violence against person and property, litigation, rivalry and groupism. Besides, discontent, mutual bitterness, factionalism, illiteracy, ignorance, caste rivalries, group conflicts, social tensions chronic under employment characterise rural society. These social factors impede agricultural production”¹

(22) Indian farmers, generally speaking, are illiterate, ignorant, superstitious, conservative and bound by old-traditions and outmoded customs and institutions. Superstition and belief in fate are the courses which keep the farmers fully satisfied with their primitive systems of cultivation. Unless the present atmosphere, which supports backwardness and stagnation, is changed there is no possibility of agricultural progress.

(23) In some cases, economic planning and farming research have themselves posed threats to areas under cultivation, production and productivity in Indian agriculture. It has been found that an “improved variety of seed sometimes requires a longer period of maturity and thus stands in the way of the cultivators raising a second or third crop. Inferiority in the taste of grain or poor quality of fodder tells on the price.”

1. Baljit Singh, *Next Step in Village India*, 1962.

(24) Above all as Dr. K.N. Raj has put it. "Raising productivity of land requires not only more inputs like labour, water and fertiliser *but incentives* to make these inputs worth while to agricultural producers."¹ So far the prices paid are not very remunerative to the cultivators and this leaves no incentive for increased production.

(25) Per hectare low productivity of Indian farm is also due to the fact that Indian agricultural organisation has failed to exploit the vast amount of labour and other resources available locally for purposes of capital formation and agricultural implements. The system of rights in land, available till recently, and the laws of inheritance certainly depressed the opportunities for investment in agriculture. Usury, by moneylenders, reinforced the extortions of the zamindars to reduce investments capacity of the peasants.

To sum up, we may say that the traditional agricultural sector has not yet completely got over the unnerving influences of nature and it still continues to be dominated by people who are illiterate, ignorant and mostly uninformed of the latest methods and techniques of production; land holdings and majority of individual cultivators continue to be uneconomic, fragmented and subdivided; cultivation of marginal lands; poverty of cultivators and lack of service facilities have all continued to be a drag on the general, operational efficiency. It now needs to be disengaged from the banes of traditionalism and lack of organisation.

However, it should be noted that peasant farming in India depends for its successful working not only on great perseverance but also unwearied exercise of prudence, forethought and watchfulness, and the utilisation of the scientific knowledge of the means of production. The value of the human factors is not to be overlooked in taking stock of the agricultural situation for "communities and nations have remained poor in the midst of rich surroundings, or fallen in decay or poverty in spite of the fertility of their soil and the abundance of their natural resources merely because the human factor was of poor quality or was allowed to deteriorate or run to waste."² Now so far as this human element is concerned, we know that the seasonal variations render agriculture a precarious occupation and the undue dependence of the cultivation on nature has engendered in him a spirit of depression, fatalism, and hopelessness unless he is assisted by the external agencies. Within the existing conditions and limitations, the resourcefulness of the Indian cultivators have been testified by experts. "The crops in the best areas or in best farms in India are no worse than those in the best areas and in best

1. K. N. Raj, *Indian Economic Growth, Performance and Prospects*, 1965, p. 11

farms in China.”¹ Says the Krishnappa Delegation Report, “But the proportion of indifferent and poor farmers is much greater in India than in China and that is the main reason why our average yield is very much lower. The main problem before us is, therefore, that of raising the level of the average farmers to that of the best farmers.”²

Reorganisation/Modernisation of Agricultural Conditions

Causes enumerated in the earlier section need to be tackled by all possible measures undertaken simultaneously. Dr. Swaminathan has rightly observed that “During the coming years, there is no option but to strive towards a vertical growth in our agriculture, since the scope for further horizontal expansion in area under different crops is very limited. The Fifth Plan indicated a proposed annual compound growth rate in productivity of 3.4 per cent in rice, 2.8 per cent in wheat and 2.4 per cent in jowar. On the basis of the productivity increase now projected, the average yields of rice, jowar and wheat during 1978-79 will be 1,375 ; 611 and 1,682 kgs per hectare respectively. In these crops, most developed and several developing countries had average yields ranging from 3,000 to 5,000 kgs. per hectare in 1971. Thus productivity got is bound to be even greater by 1979 and Indian agricultural products may become some of the most inefficiently produced in the world... If we are not going to pay serious attention to improving the productivity of our agriculture through better management of inputs and pre-and post-harvest operations, we will only perpetuate a situation where agri-

-
1. Dr A. J. Voelker has rightly remarked in this connection, “To take the ordinary acts of husbandry, nowhere would one find better instance of keeping land scrupulously clean from weeds, of ingenuity in device of water-raising appliances, of knowledge of soils and their capabilities as well as the exact time to sow and to reap as one would in Indian Agriculture, and this not at its best alone but at its ordinary level—Certain it is that I, at least, have never seen a more perfect picture of careful cultivation, combined with hard labour, perseverance and fertility of resources, than I have seen many of the haunting places in my tour.”

“Crippled by a relentless climate, for generations scourged by famine, pestilence and the war, his wealth at the mercy of every despot's whim, his cattle a prey to disease and drought, his crops periodically devastated by blight and flood serving, too, not the gentle goddess that Nature is in the West but a volcanic force of terrific power and wild caprice, how can the Indian cultivator be anything but a fatalist. In such conditions progress is impossible, knowledge, skill energy and capital must appear of little avail when man is infinitely weak and nature overwhelmingly strong.”

Nearly 50 years later Sir J. Russel said : “The Indian Rayat compares favourably with any of the peasant populations I have met in different parts of the world.” Dr. A. J. Voelker, *Report on Improvement of India Agriculture*, p. 10 and D. Dutt, *Economic History of India*, pp. 277-78.

2. *Report of the Krishnappa Delegation to China*, 1958, p. 90.

culture, instead of being productively labour intensive, would be wastefully labour extensive."¹

In any plan of economic development, therefore, the first and foremost emphasis must be placed on the improvement and extension of agriculture. Economic growth imperatively calls for a balanced expansion of the diverse sectors of the economy, and if the expansion potential in some critical sector is at a low ebb or absent, the expansion potential of the other sectors cannot become effective."² The growth of critical sectors of the economy may lag behind not only on account of some basic natural scarcity which imposes an inexorable physical barrier, but also on account of the fact that the social forces leading to expansion extend not to all sectors of the economy, but to some of them. At this point one instinctively thinks of the critical division between industry and agriculture. The growth of agriculture, of necessity, presumes the growth of agricultural production. It also postulates that the proportion of agricultural output which is not consumed inside the agricultural sector but is supplied to the industrial sector should become steadily large.³ Remarks Dr. B. Datta, "Industrialisation is possible only when agriculture has reached a high level of prosperity so as to provide self-sufficiency in food, to create a surplus for capital formation and to increase the demand for secondary products."⁴

The development of industrial production needs an increase in total agricultural production because with higher real income food consumption increases as well, though probably less than proportionately ; but more important than this, it needs an increase in the proportion of output which the agricultural sector is willing to supply to the towns, i.e., marketable agricultural surplus. In Great Britain, the so-called "Agricultural Revolution" preceded the "Industrial Revolution." It was the resulting growth in food production and in the productivity of the labour engaged on land which provided both the food and the manpower for industrial expansion.⁵ At a later stage, however, further progress of industrialisation was made possible by the food imported from the "new countries" overseas. Therefore, for promoting manufacturing industry on a gigantic scale a country has got to possess a highly efficient and considerably "commercialised" agriculture with both high yields per acre and high productivity per man.

In our own country the whole agrarian system needs reorganisation according to the present-day needs and conditions on improved lines. This would include an increase in the net returns,

1. M. S. Swaminathan, in a Foreword to P. V. Shenoi, *Agricultural Development in India*, 1975 pp. VII—VIII.
2. A. G. B. Fisher, *Economic Progress and Social Security*, p. 178.
3. Kaldor, *Characteristics of Economic Development*, p. 1.
4. B. Datta, *Economic Development of Industrialisation*.
5. N. Kaldor, *Op. Cit.*, p. 9.

reduction of production costs, better standard of living for farmer, less arduous work for the head of the undertaking and considerable saving of labour—whether paid or supplied by the family.

Increased agricultural productivity is essential for the following three reasons :¹

- (i) To supply an economic surplus that can be consumed or used for further production in agricultural or transferred out of agriculture to provide capital for industrial growth and to meet the expanding consumption needs of the urban population ;
- (ii) To make possible the release of labour and other resources for use in non-agricultural sectors ; and
- (iii) To increase the purchasing power of rural people, expand markets for industrial goods and help to bring about needed changes in the national income organisation.

The basic economic conditions for improving productivity in agriculture, according to an F. A. O. publication, are :

- (1) reasonably stable prices for agricultural products at a remunerative level ;
- (2) adequate marketing facilities ;
- (3) satisfactory system of land tenure ;
- (4) provision of credit on reasonable terms especially to small farmers, for improved methods of production ;
- (5) provision of production requisites (fertilisers, pesticides, improved seeds, etc.) at reasonable prices ;
- (6) provision of education, research and extension and agro-economic services to spread the knowledge of improved methods of farming ;
- (7) the development of sources, by the State, which are beyond the powers of individual farmers, such as large-scale irrigation, land reclamation or resettlement products ; and
- (8) extension of land use and intensification and utilisation of land already in use through improved and scientific methods of cultivation.
- (9) diversification of farm production i.e. besides cultivation of crops, dairy, poultry and fishing industries should be developed.

Possibilities of Increase in Agricultural Production

In regard to production possibilities of agricultural commodities, Dr. Burn's observations are worth noting. He has opined that

1. R.P. Christensen, "Agricultural Progress in Less-developed Countries," *Economic Development of Agriculture*, 1966, p. 34.

the yield per acre can be increased 30 per cent by the increased use of organic fertilizers, from 5 to 10 per cent by the use of improved seeds and another 20 per cent by the use of methods used for prevention of diseases and damage done by insects and pests. For individual crops the estimated increase was calculated thus :¹

Wheat	100%	Maize	35%
Rice	50%	Gram	75%
Bajra	25%	Sugarcane	100—250%

Besides, the productivity of land per acre-/hectare can also be increased as confirmed by field experiments in different parts of the country through better land use measures i.e., by crop rotation, improvements in fallowing, by ridge cultivation (55 to 60 per cent) and by shallow hoeing (25 per cent) and by double-cropping where secured irrigation is available.

Agriculture is an industry and being the biggest in India it needs capital, enterprise and brains to run it. Where these have been supplied, land resources and farming efficiency have shown surprisingly increased productivity. The information provided by crop competitions in different parts of the country reveal that much scope lies in increasing crop yield. "Yields per acre in crop competition are 6 to 7 times higher than the average yields in the respective crops for the same year and in some cases the multiple is 9, 10, 14 and 26. Prize competition yields are the results of artificial stimulus, but it is not unreasonable to assume that average yields are capable of being raised much higher, and yields in India, given the organisation and drive, can be increased by 100 to 200 per cent within a reasonable time."

All India-Crop competition—Highest yields obtained²

Crop	Year	Yield in Kgs. per hectare	Area
Paddy	1964-65	9,059	Distt. Nagpur
	1965-66	9,476	Distt. Kurnool
	1966-67	10,633	Distt. Bhandara
	1967-68	10,517	Distt. Kurnool
	1968-69	9,095	Distt. Sangli
	1969-70	14,260	Distt. Sagar
	1970-71	15,862	Distt. Bellary
	1971-72	15,324	Distt. Kolhapur

1. W. Burns, *Technological Possibilities of Agricultural Development in India*, 1944, pp. 52—68.
2. *Indian Agriculture in Brief*, 1976, pp. 116-117 ; for 1977, pp. 118-119.

	1972-73	16,912	Dist. Kolhapur
	1973-74	17,722	Distt. Kolhapur
	1974-75	14,991,912	Distt. Kolhapur
	1975-76	16,796,247	Distt. Sangli
<i>Wheat</i>	1965-66	6,618	Distt. Dhulia
	1966-67	9,286	Distt. Rohtak
	1967-68	10,335	Distt. Nasik
	1969-70	12,388	Distt. Mandasaur
	1970-71	16,117	Distt. Buldhana
	1971-72	7,599-7600	Distt. Amreli
	1972-73	12,858	Distt. Shri Ganga-nagar
	1973-74	13,999-14,960	Distt. Betul
	1974-75	13,748-0 20	Distt. Sagar
	1975-76	13,735-670	Distt. Panna
<i>Jowar (Ratr)</i>	1966-67	6,805	Distt. Bhir
	1967-68	7,600	Distt. Sholapur

It will be evident that highest yield achieved in case of rice varied between 5 to 11 times and of wheat between 3 and 14 times more as compared to the State average of different States under study. Even in the national demonstration plots, the highest yields were 50 per cent to 60 per cent above their own average. This shows that given proper use of agricultural technology, much improvement in yields can be achieved.

This fact is further proved by the introduction of new package programme in those districts which had the advantage of high irrigation/assured rainfall/strong infrastructures, high enterprise. Here properly prepared farm production plans were put into practice and adequate supply of seeds, fertilizers, pesticides, credit and marketing services were made available. The results were spectacular in those districts, and the following increase in yield was obtained :

District	% Increase in the yield of main cereal crops between 1954-61 and 1961-68
1. Ludhiana (Punjab)	86
2. Aligarh (U. P.)	43
3. Mandya (Karnatak)	42
4. Sambalpur (Orissa)	24
5. West Godawari (A. P.)	12
6. Burdwan (W. Bengal)	12

In seven districts which had the largest tenure of the programme, the production went up (during 1960-68) by 24 per cent in

wheat, by 100 per cent in maize and by 38 per cent in rice—about the double of the all India rate.

There is no doubt that Indian land resources and farming efficiency can result in raising per hectare productivity on all farms provided all the factors of production are fully exploited.

What Requires to be Done ?

The problem of agricultural production is a problem of bringing about proper combination of soil, water, plants and people for production.¹ The agricultural problem is not one of *maintaining*, but of *developing* soil productivity to the highest practicable level and of maintaining it at that level. What is to be sought in agriculture is not any kind of natural balance, but the highest level of cultural balance that modern technology and social organization make possible.

The physical resources of soil, water and climate are sufficient to yield at least double, perhaps more than double the current production with full use of machines, chemicals, sufficient water supply and a combination of other good management practices. *Mechanisation* refers to application of mechanical power to agricultural operation from sowing to harvesting stage through bulldozers, graders, tractors, seed-drills, cultivators, rollers, fertilizer distributors, combine harvestors and other light farm machinery. *Chemicalisation* means the application of chemical fertilizers. Under *rationalisation* are included the application of science to different phases of agricultural production viz., seed selection, or use of disease-resistant, high yielding varieties of seeds, use of insecticides and pesticides, erosion control etc. Irrigation gives a larger yield per acre and an irrigated crop shows a larger response to each unit of fertilizer applied to it than an unirrigated crop. Besides, availability of irrigation makes it possible to grow more crops where only one crop could be grown depending on rainfall.

It may be pointed out that no one practice is good over a wide range of soils. Nor can we usually expect the adoption of any single practice, by itself, to give an economic result. The big harvest comes from combinations of practices adopted to the particular situation. "Easy way" of emphasizing some one or two practices above all others in a "campaign" should be avoided because the results are bound to be low for the effort. For example, bunds alone, fertilizer alone, improved village alone, or improved seeds of potentially high-yielding varieties alone, may each give a small uneconomic increase on good soil under dry culture ; but the combination commonly gives a three-to-six-fold increase in the harvest.

1. Govt. of India, *Report on India's Food Crisis and How to Meet it*, 1959, p. 140.

Since, in India the basic problem is that of under-production, enhancement of all types of farm production is urgently needed. The basic approach, therefore, should be for increasing the output of all crops. The formulation of incentives for being effective, must suit the particular farms, the farmers, and the crops. For formulating proper incentives the increase in output should be classified according to the methods such as improvements in yield per hectare, expansion of area, increase in double-cropping, improvement in quality and diversification. The nature and character of the method is significant for the suitability and effectiveness or otherwise of any specific incentive.

For better quantitative production, provision of irrigation, high yielding varieties, manures, fertilizers and implements at concessional rate, should prove effective.

For better quality production, attractive prices, based on quality differentials accompanied by better seeds, should prove helpful.

For food crops and for subsistence farmers, provision of cost subsidies should be made.

For crops grown for the market and for bigger farmers, price guarantees may bring better responses.

In case of competing cash crops measures aimed at higher income at low cost may prove more beneficial ; and

Lastly, programme formulation and target fixation should be done, in view of the local situation, at the village level and mainly by local initiative and should be tailor made to suit local conditions.

Incentives must be formulated in view of the individual circumstances and they should be supplemented by persuasion which is necessary to convince the producer for taking up any programme.

Conclusions

Most of the people on land are there not because they prefer to be there but because they find it difficult, if not impossible, to be elsewhere and so for them it is more a living than a business proposition. In fact, *Indian agriculture has been and become a deficit economy and to a very great extent the Indian cultivator labours not for profit nor for a net return but for subsistence*. The overcrowding of the people on land, the lack of alternative means of securing a living, the difficulty of finding any avenue of escape and the early stage at which man is burdened with the dependents combine to

force the cultivator to grow food wherever he can and on whatever terms he can....."¹ The ordinary *cultivator on his tiny plot is still a man of small resources, with small means for meeting his small needs.*² He, therefore, requires all the help which science can afford, and which organisation, education and training can bring within his reach.

A variety of factors are responsible for this state of affairs, most important being natural, technical, economic, social, structural, institutional and administrative obstacles in the way of optimal utilization of our land resources. It has rightly been said that "the fundamental problem of agriculture is to transform this occupation from a mode of living into a business proposition for the benefit of the cultivating classes."³

If technology, currently known to India, could be applied to Indian agriculture it would be easy to increase production substantially. However, it should be borne in mind that technology will be of no avail in improving agriculture unless institutional changes (in the form of land reforms) first provide the necessary economic basis for more efficient agriculture. Gradual worsening of debt situation, violent price fluctuations, the middleman's exorbitant share and exploitation and the landlords' apathy are some of the factors which discourage the farmer to adopt new methods of techniques whose failure could ruin him and whose success benefits everyone else than him.

Therefore, the measures to trigger individual incentives are : (i) security of tenure; (ii) security to minimise the risk and uncertainties in agricultural production through price supports ; (iii) elimination of middle traders ; (iv) provision of marketing facilities, and credit institutions, (v) strengthening of extension services, (vi) putting farming on a sound economic footing through establishment and improvement in co-operative organisations ; (vii) better motivation of farmers; (viii) improvement in physical supplies of superior inputs ; and (ix) inculcation of administrative integrity.

Unless the disabilities and hindrances in the way of agriculture are reduced it seems inevitable that much of the teachings of the farm advisory services will fall upon stony ground.

1. *Report of the Royal Commission on Agriculture*, p. 433.

2. *Ibid*, p. 14, Italics added.

3. *Famine Enquiry Commission Report*, 1945, pp. 374-375.

Appendix 1
Contribution of Agriculture to National Income
 (At Current Prices) (Rs. crores)

Industry	1960-61	1965-66	1968-69	1969-70	1970-71x	1971-72x	1972-73x	1973-74x	1974-75x	1975-76x
Agriculture	6,580	9,534	14,002	15,432	16,533	16,750	18,296	24,676	27,476	26,132
Forestry & Logging	174	317	385	400	448	443	463	527	667	781
Fishing	77	122	192	212	237	256	292	350	361	427
Mining & Quarrying	134	221	306	341	351	356	384	423	663	800
Total : Primary industries	6,965	10,194	14,885	16,376	17,569	19,805	19,436	25,976	29,167	28,100
Total Net National Product at Factor Cost	13,267	20,636	28,859	31,968	34,627	36,623	39,945	49,720	58,485	60,672

xProvisional. xxQuick estimates

Contribution of Agriculture to National Income
 (At 1960-61 Prices) (Rs. crores)

Industry	1950-51	1955-56	1960-61	1965-66	1968-69	1969-70	1971-72x	1972-73x	1973-74x	1974-75x	1975-76x
Agriculture	4,936	5,699	6,580	6,148	7,155	7,612	7,973	7,359	8,042	7,699	8,712
Forestry and Logging	129	143	174	240	250	250	282	284	273	292	311
Fishing	45	60	77	91	103	106	115	120	126	123	130
Mining & Quarrying	76	95	134	188	204	214	213	222	226	245	270
Total Primary Industries	5,196	5,997	6,965	6,667	7,712	8,182	8,583	7,985	8,667	8,359	9,423
Total : net domestic product at factor cost	9,122	10,870	13,335	15,234	17,357	18,338	19,486	19,235	20,281	20,281	22,045

xProvisional xxQuick estimates

(Sources for two tables : R. B. I. Report on Currency and Finance, Vol. II 1976-77, pp. 18-19).

Appendix 2
Value of Agricultural Output

State	Gross value at current price (Rs. crores)		Net output per net hectare sown (Rs.)		Net output per worker (Rs.)	
	1960- 61	1970- 71	1960- 61	1970- 71	1960- 61	1970- 71
Andhra Pradesh	560	1268	433	900	438	806
Assam	207	469	924	1866	772	1308
Bihar	549	1132	598	1196	396	682
Gujarat	341	1052	315	956	676	1634
Haryana	156	516	385	1245	1002	2483
J. & K.	43	117	551	1362	493	1064
Kerala	268	714	1350	1378	997	2093
Madhya Pradesh	568	1296	300	596	501	898
Karnatak	705	1248	342	582	622	887
Orissa	395	1050	316	871	580	1269
Punjab	310	821	462	1276	637	1365
Rajasthan	222	801	511	1606	931	2450
Tamil Nadu	325	979	206	555	565	1350
U. P.	498	1208	669	1499	501	1038
West Rajasthan	1152	2782	479	1102	522	1057
	486	1102	791	1717	755	1333
All-India	6844	16802	430	990	563	1116

(Source : Economic & Scientific Research Foundation,
New Delhi)

Appendix 3
Share of Agricultural Exports in the Total exports

Year (April-March)	Exports of Selected agricultural commodities (Rs. lakhs)	Total Exports (R. lakhs)	% share of agricultural exports to total exports
1965-66	33,490	80,556	41.6
1967-68	49,964	119,282	41.0
1968-69	51,094	135,634	37.0
1969-70	49,433	140,870	35.1
1970-71	56,530	152,439	37.1
1971-72	58,503	156,354	37.4
1972-73	75,146	196,440	38.3
1973-74	100,675	251,834	40.0
1974-75	140,255	332,331	40.2
1975-76	165,099	391,128	42.0

(Source : *Indian Agriculture in Brief*, 1976, p. 189 ; and for 1977, p. 195.)

7.

Agricultural Holdings in India

Meaning of Agricultural Holding

The term '*agricultural holding*' implies the total area of land which is held for cultivation as a single unit by an individual, joint family or more than one farmer on a joint basis. Such land may either entirely be owned, taken on lease, or may be partly owned and partly rented.

An '*operational holding*' is one which includes all lands (i. e., cultivated, fallow and even the land which is not under cultivation) used wholly or partially for agricultural production operated as a single technical unit by a single household or a number of households operating jointly. An individual may have a single or a number of operational holdings if each of them constitutes a separate unit of management.

On the other hand, '*ownership holding*' includes all the area owned by a cultivator or a number of cultivators jointly whether under own cultivation or subject to others. The concept of this type of holding is useful under feudal systems, as it gives an idea whether land ownership is concentrated in a few hands or is evenly distributed. It may also be known if the tendency is towards further concentration of land or it is towards dispersal among a number of persons.

It also helps in finding out the level of income and living of the farmer, employment, requirements of hired labour, and utilization of farming equipment. This type of information provides the necessary background on which agrarian relations in a socialistic society could be based. If there is a heavy concentration of land in a few hands, it may be distributed among those without land through legislative measures.

Size of Holdings

The size of an agricultural holding in any country depends on geographical and climate conditions, partly upon the laws and social institutions, partly upon the methods and technique of cultivation. The ideal size of the holdings will vary likewise with the nature of the crop, and the objective behind the agricultural production. Thus,

where grain and food are in demand, the larger holdings alone can be regarded as economic. Small farms, on the other hand, are best suited for dairy produce, vegetable and fruit growing or for vine orchards. According to Carver to be most profitable a farm devoted to the cultivation of wheat must be at least 160 acres, but this is obviously an impossible ideal in the Punjab or in Tamilnadu. The question where a holding is economic or uneconomic cannot be settled in a rigid manner. Various authorities have attempted to define an economic holding for Indian conditions.

According to Keatinge, "a holding which allows a man a chance of producing sufficient to support himself and his family in reasonable comfort after paying his necessary expenses may be termed an *"economic holding"*."¹ On the other hand, Dr. Mann has defined an economic holding as "one which will provide for an average family at the minimum standard of life considered satisfactory."²

The summary of the limit of economic holdings, as prescribed by different authorities may be given below :

Authority	Economic Holding
Keatinge, W	40 to 50 acres of fair land in one block with at least one good irrigation well.
Mann, H	20 acres.
Baroda Economic Enquiry Committee	30 to 50 bighas.
Lucas, C.D.	More than 14 acres.
Darling, M.L.	10 to 12 acres, when land is cultivated on batai system.
Stanley Jevons	20 to 30 acres.
U.P. Congress Agrarian Committee	It is movable and may be between 15 to 20 acres.
Floud Commission	2 1/2 acres in Tippera District but 10 acres in Western Bengal.
Raghvacharya, T. V.	4 to 6 acres.

Prof. East has adopted 2 1/2 acres per capita as the minimum needed to produce an adequate diet for one person.³ Keeping in mind the fact that in many parts of the country two crops are raised during the year and the food requirements may be less in the East

1. W. Keatinge, *Rural Economy in Bombay Deccan*, pp. 52-53.

2. H. Mann, *Land and Labour in a Deccan Village*, Vol. II, p. 43.

3. East, "Food and Population," *Proceeding of the World Population Conference, 1927*, p. 89.

(due to warm climate) than in the colder countries of the West, we may safely assume that 5 acres is the minimum size of agricultural holding necessary for the maintenance of a family of five souls or 1 acre per capita, although differences in soil, productivity, water supply, crop rotation and agricultural practice may alter the size of the holding to some extent. Dr. D. Stamp assumed that one acre of well-cultivated land in the midlatitude is sufficient to produce an adequate diet for one person.¹

It may be said that an economic holding should be such as may offer reasonable opportunities to the peasant and his family to employ the factor units (i.e., a pair of bullocks) in the most efficient manner. The return from such a holding will depend upon fertility of soil ; intensity of cultivation ; crops raised, methods of cultivation, and the organisation of agriculture ; costs and returns and living costs.

The Agrarian Reforms Committee evolved an idea of three norms of sizes of holdings, economic holding, basic holding and optimum holding.²

According to the Committee, an *economic holding* is that : (i) which must afford a reasonable standard of living to the cultivators ; (ii) provide full employment to a family of normal size and at least to a pair of bullocks ; and (iii) have a bearing on other relevant factors peculiar to the agrarian economy of the region.

A *basic holding* is a holding smaller than the economic holding which may be able to provide a reasonable standard of living to the cultivator but not efficient for the purpose of agricultural operations. The Committee suggested such a unit for individual cultivation with the assistance of the multi-purpose cooperative organisation in all other aspects.

An *optimum holding* is the holding, which keeping in view the ceiling to the size, the managerial capacity and financial resources of an average cultivator, refers to the size not exceeding three times the size of an economic holding.

The idea of *family holding* was introduced by the Committee appointed by the Land Reform Panel of the Planning Commission to report on the size of farms. The Commission has defined the *family holding* as an area equivalent, according to local condition and under existing conditions of techniques, either to plough unit or to a work unit for a family of average size using a pair of bullocks. It suggested that a farm which yielded a gross average income of Rs. 1,600 or a net income of Rs. 1,200 and is not less than a plough unit, i. e., an area of land which an average family would cultivate with a pair of bullocks of its multiple in area, may be considered as a

1. L. D. Stamp, Land for Tomorrow, 1955.

2. Report of the Agrarian Reforms Committee, 1950, pp. 21-22.

family holding and that limit for ceiling should be three family holdings for an average family in which the number of members does not exceed 5, and that an additional family holding should be allowed for each additional number subject to a maximum of 6 family holdings. The area of family holdings throughout the country in terms of the above definition, will measure up to more than 30 acres, and in some parts, even more than 45 acres.

SIZE PATTERN OF HOLDINGS IN INDIA

Various surveys undertaken in the country show that the average size of holdings is very small. *The Agricultural Labour Enquiry* revealed that taking the country as a whole, the cultivators' holdings below one acre were 17 per cent of the total number those between 1 and 2 1/2 acres were about 21 per cent; and those between 2½ and 5 acres were another 21 per cent. About 16 per cent were in the group of 10.25 acres, and accounted for 32.5 per cent of the area; holdings above 25 acres were 5.6 per cent of the total number and covered about 34 per cent of the area. It also revealed that compared to the overall average of 7.39 acres, the size of holdings of agricultural labour families was only 2.9 acres.¹

The National Sample Survey in its 16th & 17th round (1961-62) collected data both on operational holdings and area operated by size of holdings. It estimated the number of rural operational holdings at about 49.82 crores covering an estimated area of about 32.73 crore acres. The average size of operational holdings worked out at 6.57 acres made up of 5.74 fragments on the average. According to the All-India Report on Agricultural census, 1970-71, the estimated under and an area operated by size-class of operational holdings at all-India level is given below :

Total Number and Area of Operation Holding to Size

Size class (hectares)		Number (1000)	Percentage	Number (1000)	Percentage
...	0.5	23,178	32.9	5,446	3.3
0.5	1.0	12,504	17.7	9,099	5.6
1.0	2.0	13,432	19.1	19,282	11.9
2.0	3.0	6,722	9.5	16,353	10.0
3.0	4.0	3,959	5.6	13,646	8.4
4.0	5.0	2,684	3.8	11,929	7.4
5.0	10.0	5,248	7.4	36,305	22.4
10.0	20.0	2,135	3.0	28,521	17.6
20.0	30.0	401	0.6	9,344	5.8
30.0	40.0	120	0.2	4,178	2.6
40.0	50.0	45	0.1	2,050	1.3
50.0 and above		65	0.1	5,971	3.7
Total		70,943	100.0	162,124	100.0

1. Agricultural Labour Enquiry Committee Report on Intensive Survey of Agricultural Labour, 1954, Vol. I.

It may be noted that the average size of holding, according to 8th round of N. S. S. (1954-55), was 5.43 acres. This shows an improvement in the size of operational holding, due largely to the extension of irrigation facilities and land reclamation schemes, which brought more land under the plough.

It will be seen that 50 per cent holdings, each below one hectare had only 9 per cent of the total operated area : 88 per cent of the holdings of 1 to 5 hectares in area accounted for 47 per cent of the area operated, whereas 0.4 per cent of the holdings were above 30 hectares and had 790 of the total area operated.

The size distribution has become more equitable during the 8th and 17th round. As against 71 per cent of the holdings in the size group 'less than 5 hectares' accounting for 15.6 per cent of the total cultivated area in 1954-55, 72 per cent of the holdings accounted for 19.2 per cent of the total area cultivated in 1961-62. Similarly, the size group of 5 to 20 hectares which accounted for 23 per cent of the total holdings with 41 per cent of operated area in 1954-55 has risen to about 31 per cent of the holdings comprising 52 per cent of the area. However, a decline took place in the share of holdings in the size group 20 hectares and above. In 1961-62, this size group comprised 4.5 per cent of the holdings accounting for 29 per cent of the total operated area against 6 per cent holdings accounting for 43.4 per cent of the operated area in 1954-55.

In 1970-71, the position was like this : 88.6 per cent of the holdings in the size group less than 5 hectares accounted for 47 per cent of the total cultivated area. The size group 5 to 20 hectares accounted for 10.4 per cent of the total holdings with 40 per cent of the operated area. The share of holdings in the size group 20 hectares and above was 1 per cent accounting for 13.4 per cent of the total operated area.

The average size of operational holdings showed considerable variation from State to State., ranging from 0.7 hectares in Kerala to 5.46 hectares in Rajasthan. This is revealed from the table given below :

Number and Area of Operational Holdings, 1970-71

State	No. (000)	per cent	Area (000 ha)	per cent	Average size of holdings (hectares)
U. P.	15,639	22.0	18,158	11.2	1.16
Bihar	7,577	10.7	11,480	7.0	1.52
A. P.	5,420	7.5	13,586	8.4	2.51
Tamil Nadu	5,314	7.5	7,709	4.8	1.45
M. P.	5,299	7.5	21,194	13.1	4.00
Maharashtra	4,951	7.0	21,179	13.1	4.28
West Bengal	4,216	6.0	5,062	3.1	1.20

Rajasthan	3,727	5.3	20,341	12.5	5.46
Karnataka	3,551	5.0	11,368	7.0	3.20
Orissa	3,407	4.8	6,449	4.0	1.89
Gujarat	2,433	3.4	10,000	6.2	4.11
Kerala	2,305	3.3	1,593	1.0	0.7
Assam	1,964	2.8	2,883	1.1	1.47
Punjab	1,375	2.0	3,974	2.4	2.89
Haryana	913	1.3	3,447	2.1	3.70
J. & K.	979	1.4	916	0.6	0.94
H. P.	609	0.9	931	0.6	1.53
All India	70,493	100.0	162,124	100.0	2.30

(Source : *All-India Report on Agricultural Census, 1970-71*)

According to the Agricultural Census (1970-71), of the total 70.5 million operational holdings, half of them are marginal and sub-marginal i. e., below 1.0 hectare : 19 per cent are small, i. e. 1.0 to 2.0 hectares ; 15 per cent are semi-medium, i. e., 2.0 to 4.0 hectares ; 11 per cent medium i. e. 4.0 to 10.0 hectares ; and 4 per cent are large, i. e. 10.0 hectares and above.

As for the land covered by the various size-categories of holdings, the picture is like this : marginal holdings cover 9 per cent of the total area of 162 m. hectares under cultivation ; small holdings occupy 12 per cent ; semi-medium encompass 19 per cent ; and medium and large holdings account for roughly two-third of the area. It therefore, follows that the number of tiny holdings is very large and that a major proportion of land is under big farms whose number is very small. The average size of an operational holding in the country as a whole comes to 2.3 hectares of land.

It may be noted that the average size of operational holdings is very small specially in areas with greater irrigation facilities and assured rainfall and high density of population. It is lowest in rice growing areas followed by wheat-growing areas. Millet growing areas have relatively bigger holdings. (See Appendix 2)

About three-fourths of the total cultivated area is held by 15 per cent of the cultivating house-holds. In Maharashtra, Gujarat, M. P. Rajasthan and Punjab a relatively smaller proportion of households have a higher proportion of the cultivated area, indicating that the average size of holding in these areas is comparatively large. On the other hand, in U. P., Bihar, West Bengal and Kerala, the pressure on land is higher resulting in smaller holdings.

The distribution of the cultivating households by interest in land shows that about 77 per cent are located in ownership holding : 15 per cent in mixed tenancy and about 8 per cent in pure tenancy holdings. The average size of mixed tenancy holdings is relatively high in all States except U. P. Of all mixed tenancy households, 48 per cent have holdings of less than 5 hectares. Pure tenancy holdings are concentrated mainly in Kerala, Tamil Nadu, Bihar, Punjab-

and West Bengal—where the average size varies between 2 and 3 hectares. In Punjab, Rajasthan, Gujarat and Maharashtra it varies between 7 and 10 hectares.

The distribution of cultivated land is thus very uneven. Only 1.3 per cent of agricultural families hold 14 per cent of total cultivated land. On the other hand, 57 per cent of families plough less than 16 per cent of the land. About 11 per cent of families have 37 per cent of the land; whereas 30 per cent families cultivate 32.7 per cent of the total cultivated land.

A marked variation is available in the average size of holdings in the different states of India ranging from 1.8 hectares in Kerala to 5.46 hectares in Rajasthan. Among the states which showed an average size higher than the all-India figure were in Rajasthan, Maharashtra, Gujarat, Punjab, Karnataka, M. P., and Andhra Pradesh.

It may be pointed out here that the preponderance of uneconomic holdings is not peculiar to India alone, e. g., in Japan also the small holder predominates—the average size being only 1.2 hectares there are nearly two million holders of less than 0.6 hectares and another about two million acres between 0.6 to 1.0 hectares.¹ In China also large number of holdings are uneconomic. In the Balkans the problem is similar. For instance, in a village in south-eastern Bulgaria the nature of agricultural holdings is that 12.5 per cent are below 2 hectares; 42.5 per cent are below 5 hectares, 1.5 per cent is between 7 1/2 and 10 hectares; and only 10 per cent is above 10 hectares.²

The size of holdings in India pales into insignificance when we compare the average size of holdings with those in other countries. The average size in Australia is 1993.0 hectares; 187.5 hectares in Canada; 240.0 hectares in New Zealand; 157.6 hectares in U.S.A.; 40.6 hectares in U. K., 22.0 hectares in France, 8.4 hectares in Belgium, 270.1 hectares in Argentina; and 17.6 hectares in Norway.³

India is par excellence a land of small peasants. The unit of holdings is everywhere small and uneconomic. An agricultural holding usually consists of 5 to 8 strips of land scattered over a wide area. In many parts of the country, for instance, "toy holdings" a "miniature farm" of 1/160 acre or 31 1/4 sq. yards are not uncommon. *In India the problem presents two distinct features. The first is that the holdings tend to be very small; and the second is that individual holdings tend to become broken up into a number of separate plots, often situated at a considerable distance from each other.* The former tendency is designated as *subdivision of holdings* and the latter as *fragmentation of holdings*. These tendencies have reached an intolerable point in

1. World Agriculture, p. 58.

2. Warner, Economics of Peasant Farming, p. 6.

3. Indian Agriculture in Brief, 1970, p. 288.

the Konkan, Gujarat, West Deccan, Indo-Gangetic plain and other parts of the land where fields measuring less than half an acre are to be found sub-divided into more than 20 separately owned plots, many of them of less than $1/8$ of an acre.

Sub-division of holding has reference to size of individual holdings. It varies in direct proportion to the density of population and is influenced by the law of inheritance and the break-up of the joint family system. The progress of sub-division of holdings has been going on at a rapid pace for long ; practically throughout the country. All personal enquiries conducted by the individuals as well as by the Government authorities have shown that this trend is present in almost all the states in varying degrees.¹ Recent surveys reveal that almost 76 per cent of the holdings in Andhra Pradesh, 71 per cent in the Punjab, 79 per cent in U.P., 55 per cent in M.P., 89 per cent in Tamil Nadu, 51 per cent in Rajasthan, 95 per cent in Kerala, 66 per cent in Karnataka, 86 per cent in West Bengal, 61 per cent in Maharashtra ; 84 per cent in Assam, 83 per cent in Bihar, 78 per cent in Orissa and 61 per cent in Gujarat were under 2.0 hectares. In certain villages in the States of Tamil Nadu, Bihar, Bengal, and U. P. the largest percentage of holdings is below 0.8 hectares.²

Fragmentation of Holdings

The problem of uneconomic holdings is further complicated by the practice of fragmentation of holdings. It is the breaking up of the single holdings into a number of separate plots situated at a distance from each other. It is a product of unfavourable man-land ratio, the laws of inheritance and the unrestricted transfer of land. Thus, if a father has four sons and he dies leaving four isolated fields of one acre each, the sons will not take one field each but one-fourth of each field, so that each field will be divided into four equal parts. This happens specially when lands are of different qualities and are situated in different localities. *"Fragmentation is accentuated by the expansion of cultivation irregularity over the waste, by purchase and the sales and by extinction of families in default of direct heirs and the division of their property amongst a large number of distant relatives."*³

1. (i) H. Mann, *Land and Labour in a Deccan Village*, Vol. I, p. 46 ; (ii) A.D. Patel, *Indian Agricultural Economics*, 1937, p. 124 and 171 ; (iii) M. G. Bhagat, *The Farmer, His Wealth and Welfare*, p. 93 ; (iv) Thomas and Ramkrishnan, *Some South Indian Villages—A Resurvey*, 1936, p. 9 and 71 ; Report of the Bengal Land Revenue Commission, Vol. I 1940 ; p. 86 ; and Vol. II 1940 p. 30 ; (vi) Report of the Famine Enquiry Commission, 1946, p. 256 ; (vii) U. P. Banking Enquiry Committee, Report, 1929 ; (viii) U. P. Zamindari Abolition Committee Report 1949 ; and (ix) The Agrarian Reforms Committee Report, 1948.
2. The First Five Year Plan, pp. 190-202 and Agricultural Legislation in India, Vol. II, Consolidation of Holdings, 1950, p. 1.
3. Report of the Royal Commission on Agriculture.

As a result of fragmentation, the holdings of an agriculturist do not consist of a single compact block of land but a number of small scattered plots over different parts of the village, often of a very irregular shape.¹

Authorities like Dr. Mukerjee, Mann, Keatinge, Darling, Calvert, Shah and Mukhtyar and several others have reported with alarm the distress caused to agriculture through fragmentation.

To mention only a few instances, the average size of plots in some districts of Bihar was found to vary between 2.28 and 0.81 acres ; in Chattisgarh Division of M.P. an average size of holding of 10 to 12 acres was found scattered all over the village in no less than 30 to 40 plots of land ; in Bombay and Assam, the average holdings contained 3.3 to 4.5 plots ; in Bengal there are holdings of only 0.4 acre. In Maharashtra, fields measuring less than half an acre found to be sub-divided into more than 20 separately owned plots. In Ratnagiri district plots are often as small as '006 of an acre. In the densely populated parts such as the Ganges—Ghagra Doab, the eastern districts of U. P. and Bihar ; the Padma, the Jamuna, the Cauvery and the Godawari deltas, the fractionalisation of holdings has gone to grotesque length.² In the village of Pimpla Saudagar, Mann found that 156 owners owned between them 729 plots of which 463 were less than 0.4 hectare each. In Punjab, too, fields have been found which were a mile long and a few yards wide, and others so small that cultivation in them was not possible.

According to the Report of the Congress Agrarian Enquiry Committee, "It is difficult to establish the number of peasants who own plots from 1/100 to 1/400 of a bigha but it is fairly large." As reported by some of the State Governments to the Finance Commission, 1945, that "there is a tendency in all States to progressive fragmentation of holdings."

Farm management studies conducted in India during the last few years reveal the extent of subdivision and fragmentation of

-
1. F. A. O. Documentation Prepared for the Centre on Land Problems in Asia and Far East 1955, p. 232.
 2. (i) R. K. Mukerjee, *Fields and Farmers of Oudh* ; and *Rural Economy of India*, p. 51 ; (ii) H. Mann, *Jategaon Badruk*, 1918 ; (iii) Keatinge, *Agricultural Progress in Western India*, p. 17 ; (iv) Darling, *Punjab Peasant in Prosperity and Debt*, p. 84 ; (v) Calvert, *Survey of Behrampur Village (Punjab)* ; (vi) K. B. Shah, *Economics of Rural Bengal*, p. 123 ; (vii) G. C. Mukhtyar, *Life and Labour in a South Gujarat Village*, p. 144 ; (viii) B. A. Bambawale, *Manual of Instruction on Consolidation of Holdings in C. P.*, p. 1 ; (ix) R. K. Mukerjee (Ed.) *Economic Problems of India*, Vol. I, 1940, pp. 110-111.

holdings. The number of fragments per farm increases as the size of holdings increases. But the number of fragments per acre declines with an increase in the size of the farms, as shown by the examples of U. P. and W. Bengal :—

Fragments per Holding and per Acre

Size Group (acre)	U. P.			Size Group (acre)		W. Bengal	
	No. of fragments		Per acre			No. of Fragments	
	Per Farm	Per acre				Per Farm	Per acre
Under	2.5	3.60	2.02	0.01—1.25		3.6	5.3
2.5	5.0	6.26	1.67	1.26 2.50		7.1	3.9
5.0	7.5	8.94	1.44	2.51 3.75		9.4	3.0
7.5	10.0	1.90	1.34	3.76 5.00		12.0	2.8
10.0	15.0	11.74	1.02	5.01 7.50		14.3	2.4
15.0	20.0	16.10	0.97	7.51 10.0		22.3	2.6
20.0	25.0	22.89	1.02	10.01 15.0		17.3	1.4
Above	25.0	24.85	0.60	Above 15.0		35.7	1.4

The N. S. S. during the 8th round investigated into the nature and extent of parcelling of holdings and collected information about the number of fragments constituting an operational holding.

A 'fragment' was defined as a distinct and exclusive piece of land, not connected to any other piece of land. Within an operational holding, it found fragments, which were compact pieces of land physically detached from one another. As per the findings, a holding on an average consisted of 5 fragments, the number of fragments varying from 3 in the Southern zone to 7 in the Northern zone. Further, as the size of holding increases, the number of units per holding rises. For instance, for holdings between 0.01 to 2.49 acres, the number of units is 2.8 ; for 2.50 to 4.49 acres, the number of units on an average is 7.09 ; for 5.50 to 7.49 acres, the number of units rises to 8.19 and for 7.50 to 9.99 acres, the number of unit goes up to 8.82. Beyond that, for holdings of 10 to 14.96 acres, the number moves further upto 9.21 ; for 15 to 19.99 acres, the number is still higher at 9.46 and for holdings above 20 acres the number climbs further to 9.89.

The Pattern of Land Holding in Rural Sector

Item	North	East	South	West	Central	North west	All India
1. Total no. of operational holdings ('000)	11,052 (10,467)	16,185 (15,649)	13,030 (11,409)	5,789 (4,482)	6,662 (8,113)	6,062 (4,892)	61,780 (55,012)
2. Total Area operated ('000 acres)	41,171	54,307	43,192	49,884	88,287	335,771	335,771
3. Average size (acres)	3.73 (3.93)	3.36 (3.47)	3.31 (3.79)	8.62 (11.13)	9.14 (10.88)	9.71 (12.03)	5.43 (6.10)
4. Percentage of							
(i) Holdings below average size	66.15 (65.95)	66.37 (66.09)	72.11 (71.00)	70.03 (68.12)	70.40 (69.41)	70.42 (69.40)	72.72 (72.03)
(ii) Area under such holdings	19.48 (21.13)	16.83 (17.69)	13.71 (16.36)	15.61 (21.63)	15.28 (19.42)	18.76 (24.20)	17.06 (19.50)
5. Percentage of Holdings*							
(i) Entirely owned	72.80	60.21	53.26	61.69	52.82	59.77	60.15
(ii) Entirely leased	5.83	18.53	24.92	16.96	16.61	17.52	16.94
(iii) Mixed	21.37	21.26	21.82	21.35	30.57	22.71	22.21
6. Percentage of							
(i) Agricultural holding to total holding	76.53	77.03	65.48	67.59	67.63	73.39	71.79
(ii) Area under Agricultural holdings to total operated areas	99.24	98.88	99.63	99.91	99.48	99.76	99.49

*Exclude holdings of size less than 0.005 acre.

(Source : N S S Report No. 74.)

The Pattern of Land Holding in Rural Sector—(Contd.)

Item	North	East	South	West	Central	North-west	All India
7. Average size of :							
8. (i) Agricultural holdings (acres)	4.83	4.31	5.04	12.74	13.44	13.20	7.53
(ii) Non-Agricultural holdings (acres)	0.12	0.16	0.04	0.02	0.15	0.09	0.10
Percentage of :							
(i) Agricultural holding below average size	67.45	65.89	71.06	67.37	68.47	69.54	79.22
(ii) Area under such holdings	28.94	25.79	24.05	25.68	25.49	27.47	25.48
9. Area under Agricultural Holdings ('000 acres)	40.857	53,700	43,033	49,840	87,832	58,731	333,993
10. Total Area Irrigated ('000 acres)	13,897	8,297	10,467	2,598	4,651	9,593	349.50

Notes :

(1) Zones are defined as follows :

East India : Bihar, Orissa, W. Bengal, Assam, Manipur and Tripura ; *West India* : Bombay, Saurashtra and Kutch ; *Central India* : Madhya Pradesh, Madhya Bharat, Hyderabad, Bhopal and Vindhya Pradesh ; *South India* : Travancore Cochin, Coorg, Andhra, Madras and Mysore ; *North West India* : Rajasthan, Punjab, Pepsu, Jammu and Kashmir, Ajmer, Delhi and Himachal Pradesh.

(2) The survey on Land Holdings was conducted during the period July 1954—April 1955.

(3) Figures in brackets exclude holdings of sizes less than 0.905 acre.

(Source : NSS Report No. 74).

Thus there is a clear indication of increase in the average number of fragments with an increase in the size of holdings in all zones, as would be clear from the following table :

Average Number of Fragments Per Reporting Holding by size-classes and by zones.

Holding	North	East	South	West	Central	North-west	All-India
Sizes (Acres)							
1. 0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
2. 0.01—2.49	4.04	3.51	1.94	2.36	1.69	2.81	2.89
3. 2.50—4.49	8.43	9.14	4.81	4.10	3.95	5.84	7.02
4. 5.50—7.49	10.76	10.83	6.06	4.79	4.84	7.41	8.19
5. 7.50—9.99	11.97	16.66	6.91	5.36	5.66	7.18	8.82
6. 10.00—14.99	14.82	15.79	6.95	5.46	5.65	7.14	9.21
7. 15.00—19.99	17.11	18.81	8.35	6.34	5.84	7.43	9.46
8. 20.00 and above	23.43	25.67	10.81	7.22	7.17	7.28	9.88
9. All Sizes	7.02	6.89	3.22	3.72	3.64	4.86	5.09

The practice of fragmentation of agricultural holdings is not peculiar to India alone but it occurs in European as well as Asiatic countries too. This evil prevails in France, Switzerland, Germany, Bulgaria, China and Japan. A Chinese farm does not normally lie in a compact block but it consists of anything from 5 to 40 scattered squares, oblongs, strips, wedges and corners of land scattered over hedges, fields and sometimes at a distance of more than a mile from each other.¹ The reasons given for this arrangement by the peasants in China are the same as those given in the past by the peasants in Europe.

Characteristics of Small Holdings

The main features of small holdings are :

(i) *Small units of cultivation reflects serious imbalance in the man-land ratio.* In contrast to bigger holdings, which suffer from low availability of labour, supervisory and management inputs, these over-crowded small units suffer from scarcity of land. This imbalance in land-man ratio is the primary cause of setting in traditionalism in farming, misallocation of human resources, low marginal productivity of labour and other inputs and an early operation of the Law of Diminishing Returns in agriculture, small output, small savings and the subsistence-oriented character of farm organisation and management.

(ii) *There is excess supply of labour.* Investigations made show that labour supply for work on own farm with the smaller farmer is many times that of the big and little less than twice of the medium farmer. In majority of cases, the area under irrigation on small holdings being small, the intensive cultivation did not help in absorbing surplus labour substantially.

(iii) *They normally suffer from higher investment per hectare.* especially in the form of houses. This higher investment per hectare on small farms is matched by poor and under-equipment.

(iv) *Farm practices are inferior,* there is low yield per hectare and the selection of crops is limited. The small farmer grows generally low price crops mainly owing to limitation of investment.

Disadvantages for Sub-division and Fragmentation

Subdivision and fragmentation of holdings has resulted in making Indian agriculture an unremunerative industry. Observes Dr. Baljit Singh, "From the standpoint of production the average low size of holdings in the country has resulted in a deficit economy with high costs of production and low output."² Similar are the views of Jacoby. He says, "the smaller, the more fragmented and uneconomically shaped the farm is. the more expensive is produc-

1. Reserve Bank of India, Consolidation of Holdings, 1948, p. 72.

2. B. Singh, Whither Agriculture in India p. 72.

tion, since cultivation and harvesting are more complicated, the supervision of labour is either more expensive or insignificant, and proper drainage or irrigation is often impossible."¹

Following are the disadvantages of sub-division and fragmentation of holdings :—

(i) The fragmented and uneconomic holdings have brought about progressive agricultural deterioration and aggravated the poverty of the masses.

(ii) The cultivation of an unduly small holding entails waste in a variety of ways. This practice involves encroachment on the soil otherwise available for cultivation. It entails waste of land in boundaries, hedges and pathways, e.g., it has been calculated that in the Punjab 9 per cent of the land is wasted as it is in fragments too tiny to be cultivated, and 10 per cent is lost to cultivation in boundaries to demarcate holdings.

(iii) Sub-division progressively reduces the average size of holdings. When the holdings get smaller the proportion of fixed costs to the total costs of cultivation increases. Some of the cost incurred by the farmer such as expenses of maintaining his family a pair of bullocks and a few agricultural implements do not decrease proportionately when his holdings get smaller.

(iv) Sub-division also means a rise in the variable costs. The costs of fencing per hectare, of manure and seed, are all higher when the farmer cultivates a small other than a big holding, in which case fencing may not be done to the fields leading to damage by stray cattle from the neighbouring fallow fields.

(v) Neither the improved implements nor the permanent improvement of any sort of land can be made because of the tiny size of the holdings. Dr. Mukerjee is right when he says that "in many tracts the inefficiency of agriculture is due more to the small size and scattered nature of the holdings than to ignorance or want of alertness on the part of the peasants. Such holdings do not afford sufficient work for the cultivator and leave him almost unemployed during most part of the year. Agricultural indebtedness is at once the cause and effect of the excessive division of holdings, and very often enforced idleness and indebtedness go together."²

(vi) When holdings are intensely fragmented, much time is naturally lost in moving from one plot to another, particularly at the time of sowing, watering, weeding and harvesting from the field to the threshing floor, barn and store-house. Personal supervision is rendered difficult because unless the plot is large enough it does

1. E. H. Jacoby, *Interrelationship Between Agrarian Reforms and Agricultural Development*, F. A. O., 1953, p. 22.

2. R. K. Mukerjee, *Op Cit.*, p. 63.

not pay to erect platforms to keep an eye on the standing crops. Further, if the family is small, the owner has to content himself with a morning and evening visit to his various fields leaving the rest to chance. Carriage of manure is easier and more economical if the land is in one block and so it is usual to manure the plots which lie near the heaps. Sri B. P. Misra has estimated that the expenses of cultivation increase by 5.3 per cent for every 500 metres of distance for manual labour and ploughing, from 20 to 25 per cent for the transport of manure and from 15 to 32 per cent for carriage of produce and 53 per cent increase in expenditure on labour. The net yield, therefore, decreases with every increase in the distance from the village.

(vii) Fragmentation creates difficulties in maintaining correct levels and making provision for surface drainage. When a land-owner holds his land in scattered bits he has naturally less incentive to spend money on the maintenance of proper drains to prevent waterlogging and on the construction of embankments to check soil erosion.

(viii) When land is excessively fragmented, irrigation often becomes impracticable, although sufficient water may be available. Water cannot be supplied so as to reach all the little parcels into which an individual holding may be cut, and besides this there is the difficulty of taking the water by channels which will have to run through other people's fields. The difficulties over the channel along which water is to be taken as well as over its distribution leads to much bickering and bad blood.

(ix) Fragmentation also brings in its train the invariable crop of disputes regarding boundaries, rights of way, etc., leading the farmers into expensive litigation.

Dr. Mann sums up the position thus : "It has, in fact, all the evils of very small holdings in that it prevents the use of machinery and labour saving devices ; and on the other hand, of large holdings in that it hinders the adoption of really intensive cultivation by hand labour which is the great advantage of the small holder. Difficulties to connection with putting up fences, protection from the invasion of weeds from neighbouring fields, protection from stray cattle and from the depredations of thieves are common to excessive sub-division and fragmentation."¹ The combined result of this is to drive the land out of cultivation. This destroys enterprise, results in an enormous wastage of labour, leads to a very large loss of land owing to boundaries, makes it impossible to cultivate holding as intensively as would otherwise be possible, and prevents the possibility of introducing the outsiders with more money, as tenant farmers or as purchasers of a good agricultural property.² Both

1. H. Mann, *Op. Cit.*, p. 48.

2. *Ibid.*, p. 154.

sub-division and fragmentation has circumscribed the application of efficient method of production.¹

Advantages of Sub-division and Fragmentation of Holdings

Sub-division and fragmentation have their merits too. It has been observed that "the small units of ownership need not always lead to small units of farming, "if ownership is pooled for farming purposes. Similarly, sub-division of property need not necessarily lead to augmentation of individual holdings if the inherited area is divided into as many units only as the number of heirs."²

Merits of both these tendencies are :—

(i) It must not be supposed that all cases of fragmentation are undesirable. By having their holdings scattered in different parts of the village the farmers are able to take advantage of different soil conditions, and it facilitates the distribution of work on the fields, for it may and it does happen that when it rains in one part of the village, the field in another part, where it may not rain, can either be ploughed or prepared for sowing the seed. It thus enables him to make a more effective use of his time and labour and of his bullocks.³

(ii) This process of fragmentation ensures that every holder has share of all qualities of the soil, which in a system of subsistence farming is a matter of some importance, since it enables him to grow all the various crops which he requires for his own and his family's food, and also acts as an insurance against the total failure of crops which might occur if they were grown in a compact area.⁴ Further, vegetable crops and garden products requiring close watch and personal supervision, can be grown more suitably on small units of cultivation.

(iii) The sub-division of holdings prevents the division of society into two antagonistic classes, i.e., a class of big landlords and a class of landless agricultural labourers. It ensures a certain degree of economic equality and helps to create a class of peasant proprietors who have a stake in the land and are firmly attached to the soil.

But these advantages are not regarded as substantial, for they are more than offset by its evils.

Causes for Sub-division and Fragmentation

Various reasons are responsible for causing sub-division and fragmentation of holdings, such as :

1. F. A. O., *The Consolidation of Fragmented Agricultural Holdings*, 1950, p. 5.
2. F. A. O., *Documentation Prepared for the Centre on Land Problems in Asia and For East*, December, 1954, p. 45.
3. J. B. Shukla, *Land and Labour in a Gujarat Taluka*, p. 133.
4. R. G. Allen, *Social Service in India*, p. 133.

(i) *Excessive Pressure of Population on Land.* As population increases the available supply of land per head of population decreases. "The net cultivable area did not expand in proportion to the total increase in population and as each generation (entered) into its patrimony, the extent of land that (went) to the share of each heir (diminished)"¹ The failure of agriculture and industries to develop *pari passu* with the increase in population has been the most outstanding cause of sub-division of holdings.² Due to heavy pressure of population, the area of farm is divided into a number of tiny fields and consequently the size of farm becomes smaller, the farm land is scattered around the distant places, and the shape of field becomes irregular.³

(ii) *Defective Laws of Inheritance and Succession.* This process of sub-division and fragmentation is helped by the operation of the Laws of Succession and Inheritance. As Dr. Mukerjee observes, "Indeed, the tendency towards sub-division, which has been manifest in India during the last few decades only, has been the outcome of the interpretation of Hindu and Mohammadan Laws by English judges, with their strong predilection of individual succession to, and private enjoyment of, rights in land."⁴ At the time of succession every son insists on getting a price of every kind of land. In the words of Mr. Clow, "Everything is divided—shares, holdings, plots, tenant's houses, groves, ponds, and even trees. And where there is no formal partition there is always an informal one. When once it is decided to partition property, the desire to ensure perfect equality of shares leads to fragmentation. They will go even so far as to fight over the partition of honey on the branch of a tree; they have been known to fight over the partition of the shade of a tree, not its fruits, nor its branches."⁵

(iii) *The Absence of the Alternative Sources of Employment.* This is the chief cause of sub-division and fragmentation because with the decay of cottage industries, artisans had to fall back upon land as there were no factories to absorb them. The sub-division and fragmentation increased due to land-hunger created by a growing population incapable of being absorbed in non-agricultural occupations."⁶

(iv) *The village money-lender also played a part in aggravating the evil* "In addition to the laws of inheritance, unequal fertility and assessment, another cause which contributed to this state of affairs is

1. M. B. Nanavati and J. J. Anjaria, *The Indian Rural Problem*, p. 154.
2. B. Singh, *Op. Cit.*, p. 71.
3. F. A. O., Documentation Prepared for Land the Centre on Land Problems in Asia and Far East, 1954, p. 232.
4. R. K. Mukerjee, *Land problems of India*, p. 55.
5. Quoted by Jathar and Beri, *Indian Economics* Vol. I, p. 186.
6. Wadia P. A. and Merchant, K. T., *Our Economic Problem*, 1950, p. 217.

the absorption of large amounts of land into the hands of the village *sowkar* by means of foreclosure of mortgages or sales. The agricultural population in consequence has only a limited area to divide among themselves, so far as the occupation of the land is concerned.”¹

(v) *Various land reform measures have also indirectly increased the pressure on Land.* The ablation of intermediary tenures and tenancy reforms has created a large number of owner cultivators. Ceiling on land holdings has also resulted in the acquisition of some surplus land for redistribution among landless labourers and owners of small holdings. Besides, the delay in the implementation of the legislation has enabled big owners to dispose of their surplus land through mala fide transfers in the shape of *benami* transactions.

(vi) Advancing indebtedness, mortgages into possession, land speculation and even indiscriminate investment in land during the Plan period has further aggravated the problem.

(vii) Finally, the process of sub-division and fragmentation may be further complicated by voluntary transfers by sale, gift or otherwise.²

REMEDIES FOR SUB-DIVISION AND FRAGMENTATION OF HOLDINGS

If the pattern of land ownership is to be conducive to agricultural development it is imperative that :

- (i) the ownership of land of too small pieces is avoided by pooling together these pieces through consolidation.
- (ii) fragmented holdings are re-grouped through co-operatives;
- (iii) fragmentation of holdings in future is prohibited ; and
- (iv) the creation of economic holdings is promoted.

Consolidation of Holdings

Consolidation of holdings has been regarded as the best remedy for fragmentation. Even the Planning Commission has said that “in all States programmes for consolidation of holdings should be expanded and pursued with vigour.”

By ‘consolidation’ is meant the bringing together in one compact block all plots of land of a cultivator which are scattered all over the village. Consolidation is achieved by first pooling all land in the village in one block and then dividing it into compact blocks among all the farmers in the village. This reduces the number of fragments in holdings by making the fields contiguous to each other.

1. Report of the Pardi Taluka Economics Enquiry Committee, 1976, p.16.

2. Nanawati and Anjaria, *Op. Cite.*, p. 169.

The need for legislation for speeding up the consolidation work was felt early, the Report of the Royal Commission on Agriculture drew attention to the need of undertaking surveys and checking further sub-division. Three stages may be marked in the history of legislation for consolidation. *In the first stage*, legislation was permissive, as in the Baroda Act of 1920. *In the second stage*, an element of compulsion, as in the C.P. Consolidation of Holdings Act, 1928, was introduced. *In the third stage*, a scheme of consolidation can be enforced in any given area without willingness of the holders of the locality as in the Bombay Holdings Act, 1927.

Special legislation has been enacted for consolidation in M.P., West Bengal, Gujarat, Maharashtra, U. P., H. P., Jammu and Kashmir, and Rajasthan. In Gujarat, M. P. and West Bengal, State laws provide for consolidation on a voluntary basis on application of land holders. In other states the law provides for compulsory consolidation. In Haryana, Punjab and U.P the consolidation of holdings has been completed. Some progress has been made in other states too.

The U.P. Consolidation of Holdings (Amendment) Act, 1958, aims at removing delays in consolidation operations. In Assam, the Assam Consolidation of Holdings and Prevention of Fragmentation Act was enacted in 1958. Sub-letting has been prohibited in some States except in certain deserving cases. In many other States the Government has assumed the power to take over lands which remain uncultivated for more than a specified number of years and make arrangements for their cultivation.

*The main provisions of the Consolidation Acts relate, inter alia (i) to fixation of minimum standard area for regulating transfers, (ii) prohibition of fragmentation below standard area, (iii) schemes of consolidation by exchange of holdings, (iv) reservation of areas for common purposes, (v) procedure for payment of compensation to persons allotted holdings of less market value than their original holdings, (vi) prescription of rights of persons in the new holdings and administrative machinery for carrying out schemes, and (vii) filing of objections, appeals and penalties.*¹

Under legislation, if half the farmers possessing two-thirds of lands in a village desire consolidation, they can make a petition to that effect to the Government when the proposal is accepted, the rest of the farmers are required to join the scheme of consolidation. The consolidation work is then entrusted to a Consolidation Officer, who pools all the lands in the village by removing the boundaries, fences, etc. and redistribute them among the cultivators in compact blocks.²

1. I. L. O., Recent Developments in Certain Aspects of Indian Economy Vol. I, 1956, p. 30.
2. The procedure of consolidation consists of (i) preliminary arrangements (ii) rectangulation and measurement : (iii) classification and valuation (iv) repartition ; and (v) preparation of final papers and their final attestation.

Consolidation has made good progress. Up to 31st January 1956, only 4.5 million hectares were consolidated. By the end of the Second Plan about 12 million hectares were consolidated. By March 1977, about 44.0 million hectares had been consolidated.¹

Progress in Consolidation of Holdings (Area in 000 hec.)

States	Levels Achieved			Fourth Plan Programme	Level Anticipated 1973-74
	1960-61	1965-66	1968-69		
A.P.	127	337	337		337
Assam		2	2	41	43
Bihar	24	71	71	165	236
Gujarat*	375	625	848	410	1258
Haryana			121	**	121
J.&K.		22	24	41	65
M.P.*	1560	2378	3019	1230	4249
Maharashtra	626	2202	3732	3345	707
Karnataka	406	772	1322	**	1327
Punjab	6011	9203	9203		9202
Rajasthan	571	1722	1744	—	1743
U.P.	2201	6482	8881	3400	12284
W.Bengal	—	—	—	710	711
Delhi	83	83	83	—	80
H.P.	66	49	785	82	263
Total	12,050	24,073	29,572	9,424	38,969

*Includes progress prior to April, 1951. **Works completed.

Difficulties in the Way of Consolidation

Difficulties which confront the work of consolidation are partly psychological and partly of a practical nature. They are :—

(i) Generally the farmers are extremely attached to their ancestral land and, therefore, unwilling to give it up for the sake of consolidation of holdings.

(ii) As the farmers are still conservative and illiterate, they often do not understand the full implications of the benefits of consolidation.

(iii) Those having better quality of land do not like to combine for fear that they may get inferior blocks after consolidation.

(iv) The movement, in general, has not evoked the necessary cooperation from the rich and influential farmers who generally propagate against the process of consolidation.

1. India 1977 & 1978, p. 219.

(v) Consolidation costs money and the difficulty of finding finances discourages smooth working. Hence, there are three different kinds of arrangements for meeting the cost of consolidation : (a) In Delhi, M.P. and Punjab part of the cost is recovered from the cultivator in the shape of fees of consolidation. In Delhi, M.P. and Punjab the cost of consolidation per acre came to Rs. 4-6-0, Rs. 4-4-0, and Rs. 1-5-0 respectively, and the cultivator was charged a consolidation fee of Rs. 3-12-0, Rs. 4-0-0 and Rs. 0-12-0 respectively, (b) the cost may be met entirely by the Government as in Maharashtra, where as a concession to the cultivator the work is done free of cost : and (c) as in U.P. where the entire cost is to be recovered from the cultivator at the rate of Rs. 4 per acre.

(vi) Lack of adequate trained staff and lack of reliable and adequate revenue records showing names of owners and tenants and lack of upto date cadastral maps and soil classification are also responsible for the slow progress of consolidation work.

(vii) In many cases, the good work done is wasted since proper measures are not taken to prevent further fragmentation after consolidation.

In the words of the Planning Commission, "A major weakness of the programme has been that the consolidation was done without taking effective steps to ensure security of tenure to tenants, particularly share-croppers. As a result, consolidation of holdings has often led to the large scale ejection of insecure tenants."

2. Consolidation of Holdings Through the Co-operative Societies

Apart from compulsion, the best instrument for securing the consolidation of holdings is the development of cooperative societies. The main merit of these societies is that it is voluntary, that it rests upon the education of public opinion in favour of consolidation and upon the persuasion of the landholders concerned. Once the voluntary agreement is sponsored by the co-operative consolidation of holding society, the results are permanent as the landholders once they realised the evils of fragmentation are not to allow its re-emergence after some time. But the greatest difficulty in co-operative methods is that it is slow, the work of consolidation in a given area might be held up if a small and obstinate minority refuses to agree to any scheme of reallocation of lands. Other hindrances to consolidation through co-operative societies are : (i) the indebtedness of the plot on a large scale ; (ii) the lethargic attitude of the people ; (iii) sentimental attachment to land ; (iv) want of adequate areas of the same kind of land for exchange ; (v) lack of adequate and persistent propaganda and ; (vi) the lack of efficient staff to carry out the legislative measures.

Consolidation of Holdings in Foreign Countries

In countries like France, Belgium, Germany, Switzerland, Denmark, Holland, Japan and Russia, the State has intervened with

compulsory legislation regarding consolidation of holdings. All these countries have solved this problem through a number of remedial measures partly by the purchase of small parcels to round off their own holdings by the peasants, partly by limiting the size of an average family through birth control and partly by legislation.

A study of the movement of consolidation of holdings in these countries brings out many interesting points of similarity in their efforts and experiences as given below :—

Firstly, all of them found that the improvement of agriculture was hampered by fractionalisation of holdings and, therefore, consolidation formed an important link in any scheme of agricultural development. *Secondly*, all of them had to take administrative and legislative action for restripping because private agreements at consolidation without the force of law failed. *Thirdly*, to carry on the work of improvement consistently and steadily, specially trained staff had to be engaged resulting in a large expenditure. *Fourthly*, the governments had to give liberal grants to meet the cost of restripping. *Fifthly*, an adequate financial help had also to be given to enable the farmers to improve their methods and technique of cultivation. *Sixthly*, the legislation has been adopted in a number of countries and embodied in these principles : (i) compulsory expropriation of existing holders (ii) compulsory reconstituting of holdings at the instance of a certain proportion of landholders or in some cases without it (iii) subsequent indivisibility of reconstituted holdings, (iv) exemption of holding from seizure for debts, and (v) prevention of reconstituted holdings from being combined with other holdings.

Co-operative Village Management

Consolidation of holdings does not promise to give the cultivator an economic holding. If the cultivator has a small area of land scattered in different parts of the village consolidation will bring the land together but it cannot possibly increase the size. In order, therefore, to provide economic holding for each cultivator a much bigger effort is required as envisaged under this scheme. Three points are to be specially noted for understanding the meaning of *Co-operative Village Management* ideal : (i) co-operative village management assumes that peasant-proprietorship of land holdings exists, (ii) It makes a distinction between the unit of management and the unit of operation; (iii) Once the stage of co-operative village management is reached the distinction between cultivators with land and without land would become less significant : the resources of the whole village community will be utilised for securing maximum increase of production and employment by means of co-operative activities within and beyond the villages. Thus, what is ultimately visualised is an integrated socio-economic rural structure in which agricultural production, village industries, processing industries, marketing and rural trade are all organised on co-operative lines.

According to the Planning Commission the village should be made the primary unity of management in agriculture. The primary object of village Management is to ensure that the land and other resources of village can be organised and developed from the standpoint of the village community through the agency of *village panchayats*, *gaon sabhas* or some other similar organisation of the people in the village. During the transition to co-operative village management, lands in the village will be managed in three different ways: *Firstly*, there will be the individual farmers cultivating their own holdings. *Secondly*, there will be groups of farmers who pool their lands voluntarily in their own interest into co-operative working units. *Thirdly*, there will be some land—such as common lands of the village, or the lands available for the settlement of the landless—belonging to the village community as a whole. Thus one would visualise within the scheme of land management in each village an individual sector, a voluntary sector and a community sector.

3. Restriction on Further Sub-division and Fragmentation

Regarding the attempts at consolidation of holdings Dr. Darling says, "It is easy to chronicle the results but most difficult to produce them. Everyone has to be satisfied and all conflicting interests reconciled. The ignorant have to be enlightened and the stubborn conciliated. The poor, the weak and the speechless have to be as much regarded as the rich, the strong and the vocal. The only weapon is the tongue and the only means persuasion. Moreover, technical difficulties abound and underlying all this is the peasants' passionate love for his land with the jealousy of neighbours that passions breed. In such circumstances the work must be slow. The marvel is that it is done."

Consolidation in itself offers no permanent solution and the problem is likely to recur with every new generation. Restrictions are, therefore, necessary on future partitions, exchanges or transfers.

Sub-division of farms can be prevented through : (i) change in the Laws of Inheritance whereby the land passes only to the eldest son ; and (ii) sub-dividing land only upto a certain stage beyond which further sub-division should be prohibited.

Legislation has been enacted for this purpose in Assam, Bihar, Gujarat, M. P., Maharashtra, Orissa Punjab, Rajasthan, U. P., West Bengal, Manipur, Tripura and in the former Hyderabad areas of Andhra Pradesh and Karnataka. It has not yet come into force in Orissa, Punjab and West Bengal.

APPENDIX 1

Average Size of Farms in Selected Regions

Region	Farm Management Survey period	Average size (Hectares)
<i>U.P.</i>		
Meerut and Muza- ffarnagar	1954-55 to 1956-57	4.17
Deoria	1966-67 to 1968-69	2.86
Muzaffarnagar	1966-67 to 1968-69	6.57
<i>Punjab</i>		
Amritsar & Ferozepur	1964-55 to 1956-57	7.10
Ferozepur	1967-68 to 1969-70	12.44
<i>West Bengal</i>		
Hooghly & 24 Parganas	1954-55 to 1956-57	1.23
Nadia & Hooghly	1970-71 to 1972-73	1.21
<i>Tamil Nadu</i>		
Coimbatore & Salem	1954-56 to 1956-57	3.10
Thanjavur	1967-68 to 1969-70	3.08
Coimbatore	1970-71 to 1972-73	5.82
<i>Maharashtra</i>		
Ahmednagar	1954-55 to 1956-57	8.00
Nasik	1945-55 to 1956-57	7.38
Akola and Amravati	1955-56 to 1956-57	8.88
Ahmednagar	1967-68	9.54
<i>Andhra Pradesh</i>		
West Godavari	1957-58 to 1959-60	3.35
Cudappah	1967-68 to 1969-70	5.83
<i>Orissa</i>		
Sambalpur	1957-58 to 1959-60	2.16
Cuttack	1967-68 to 1969-70	1.81
<i>Bihar</i>		
Monghyr	North Zone 1957-58 to 1959-60	1.85
	Central Zone „ „	2.69
	South Zone „ „	4.33
Shahabad	1961-61 to 1962-63	4.35
<i>Haryana</i>		
Karnal, Rohtak and Jind	1961-62 to 1963-64	5.87
<i>M.P.</i>		
Raipur	1962-63 to 1964-65	3.39
<i>Rajasthan</i>		
Pali	1962-63 to 1964-65	5.30

Kerala

Alleppey and Quilon	1962-63 to 1964-65	3.44
---------------------	--------------------	------

Gujarat

Surat	1966-67 to 1969-70	4.39
-------	--------------------	------

Assam

Nowgong	1968-69 to 1969-70	3.10
---------	--------------------	------

Source : *Reports on Farm Management Studies*)¹**Appendix 2****Average Size of Farms and Family**

State	Year	Average Size of farm (ha)	Average Size of Family
1. Paddy Growing States			
Andhra Pradesh	1971-72	1.90	5.35
Assam	1971-72	2.54	7.90
Orissa	1972-73	1.86	6.66
Tamil Nadu	1971-72	1.29	5.43
West Bengal	1971-72	1.19	5.36
2. Wheat Growing States			
Haryana	1971-72	5.37	7.92
H. P.	1973-74	1.18	7.01
Punjab	1971-72	5.81	7.90
U. P.	1971-72	2.71	6.70
M. P.	1970-71	4.29	6.55
3. Millet Growing States			
Gujarat	1971-72	5.80	5.51
Karnataka	1972-73	5.06	5.86
Maharashtra	1971-72	4.83	7.02
Rajasthan	1971-72	8.22	6.84

1. *Indian Agriculture in Brief*, 1977, p. 76,

Agricultural Inputs and Technology

Agricultural production and efficiency largely depend upon the inputs applied and the methods adopted. In India, "while population grows, the land surface is fixed and of this only a certain proportion is available for cultivation"¹ Further scope for bringing extra land under the plough is limited. If more production is to be got out of the existing area, the problem has to be tackled on a wide front. This can be done by applying inputs in a more intensive way and by adopting modern methods of production through use of improved technology, besides making an adequate provision for institutional financing, better methods of marketing, etc.

TECHNOLOGY

Technical factors, *i. e.*, technology have received increasing emphasis and the recent breakthrough in agriculture is the outcome of these factors. These technical factors comprise :

1. Irrigation,
2. Rural electrification,
3. Organic manures and chemical fertilizers,
4. Improved seeds,
5. Plant protection measures,
6. Agricultural implements,
7. Soil conservation and dry farming,
8. Land Reclamation and Developments.

The combination of these factors is bound to result in increased production. The role of soil conservation measures and dry farming has already been discussed in chapter 2 and chapter 3 respectively. Other factors are discussed in this and the subsequent chapters.

Irrigation

Agriculture has held a dominant position in the country's economy. But this major occupation is rendered hazardous by scanty rainfall in large areas and by erratic monsoon elsewhere. Partial failure or even delayed arrival of the monsoon can cause extensive damage to crops. Conscious efforts are, therefore, being made

1. Planning Commission, *Third Five Year Plan*, 1961, p. 183.

continuously to supplement rainfall and to mitigate the grave consequences of a dry spell by supplying water artificially to parched lands. *Irrigation implies maintaining the storage of water in the soil required for plant growth at times and places of deficient water supply.*

Different systems of irrigation are complimentary and supplementary rather than competitive, as has been rightly observed by the Famine Enquiry Commission. "The problem of water supply will not be solved by mere extended application of one particular method of irrigation but by the use of all methods."² Irrigation comprises of three different aspects, viz., engineering, agricultural and economic and social. Under *engineering aspects* are included the designing and construction of structures required for storage, diversion, conveyance, delivery and distribution through channels and distributaries, determination of water yields of rivers and water supplies for irrigated lands. The *agricultural aspect* refers to the use of irrigation water and various agricultural practices and cropping patterns, methods of application and the quantity of water for single irrigation. The *socio-economic aspect* refers to the satisfaction of social needs and desires which is essential for any community enterprise

Need for Irrigation

The necessity for irrigation arises due to the following reasons :— (i) Nearly 70 per cent of the country's gross cropped area depends exclusively on rainfall which is unevenly distributed both in respect of time and space. The rainfall is thus most unreliable and is marked by wide variations in different parts and also variation from year to year in its quantity, incidence and duration. India is served by south-west and the north-east monsoons. Most of the rainfall (*i. e.*, about 73.7 per cent occurs during June—September ; while winter rains amount only to 2.6 per cent ; post monsoon rains are about 13.3 per cent and premonsoon rains about 10.4 per cent ³

The rainfall over the country is unequal, irregular and quite often liable to complete failure. With such a wide difference in rainfall between one part and another (such as 1270 cms. at Cherapunji and only 25 cms. in western Rajasthan), famines have occurred several times in the past. The areas generally affected by variations in the rainfall are those which receive a rainfall of 127 cms. and less per annum. Whenever rain fails, *i. e.*, when it is less than 80 per cent of the average, or when it does not occur at the proper crop season, production falls. If deficiency of rainfall is 40 per cent or more, famines result and crops do not even grow. To banish famines, the only remedy is artificial supply of water to the lands through irrigation. Sone Canal command area and the Krishna and

1. *Final Report of the Famine Enquiry Commission*, 1945, p. 129

2. *Indian Agriculture in Brief*, 1976 p 27.

Godawari deltas, which are today the granaries of rice, used to be famine-ridden only a few years back. *Irrigation is the antidote to famine.*

(ii) Irrigation is deemed necessary for the maximum production of most farm crops, especially in the arid and semi-arid regions. Even in the areas of high rainfall, irrigation of second and third crop or for multiple-cropping when rainfall fails. According to the I.C.A.R., the production of irrigated crops is on an average 50 to 100 per cent higher than that of the unirrigated crops in the same locality. According to a *Note on the Rate of Growth During the Fourth Plan*, the average yields of irrigated fields have shown a wide difference over the unirrigated fields, such as in case of rice it has been of the order of 52.5 per cent ; wheat 53.1 per cent ; barley 57.2 per cent ; bajra 48.9 per cent ; maize 53.0 per cent ; and total production 92.6 per cent during 1964-65. It has been estimated that if proper irrigation facilities are provided to rice and wheat producing areas, the additional production of the two crops may be increased by 10 and 6 m. tonnes respectively.

(iii) In India, the growing population demands higher quantities of foodgrains for its consumption, but in the absence of which imports ranging from 150 to 200 crores of rupees per annum have to be made. To cut short imports, self sufficiency in food grains is very necessary. This can be achieved, besides putting various inputs in the fields, through increasing irrigation facilities. In fact, among the measures that may be adopted for increasing area under cultivation and the yield of crops, the first place must be given to the works for the supply and conservation of water.¹

(iv) At present 20 per cent of the cropped area of the country is under cash crops, which produces 30 per cent of the country's production commanding 33.3 per cent of the total value of agricultural products. Only about 12 per cent area under cash crops is irrigated at present. As is known, cash crops ensure employment through industries, and about 60 per cent of the annual foreign exchange earnings come from these products (pepper, spices, tobacco, cashew-nuts, cotton, jute and oilseeds etc.). Therefore their productivity can be stepped up through provision of increased irrigation facilities. With regard to cereals, where the mean percentage variation in production from year to year is large, improvement in irrigation facilities leads to higher yields.

Water requirements of crop depend primarily on climatic and soil factors. Crop season in India is predominantly *kharif* followed by *rabi*. The area under cultivation during hot weather is very small being less than 5 per cent. During *kharif*, the monsoon meets a substantial part of water requirements of crops. The following table,

1. *The Famine Enquiry Commission, Final Report, 1945*, p. 135.

given by the National Commission on Agriculture shows crops which fit in different ranges of total utilizable water available during kharif and rabi.¹

Crops for Different Ranges of Water Availability

Water supply (mm) Total	Kharif Crops	Rabi crops
150—250	Green manure crops	—
250—400	Pearl millet, sorghum, maize fodder, pulses, green gram, black gram, oilseeds, castor, sesame	Barley, gram, peas, saflower, sunflower linseed, mustard
400—600	Sorghum, groundnuts, soya- bean, tobacco, cotton, vege- tables	Wheat, barley, sor- ghum, potato, onion, coriander
600—1000	Maize, cotton, jute, vege- tables, turmeric, ginger	Berseem, lucerne
More than 1000	Rice	

Within limits some extra moisture stress does not seriously affect yield. Deep rooted crops can tolerate longer dry spells than the shallow rooted ones. Similarly, hot weather crops use up water at a faster rate than rabi and kharif crops because of the higher rate of evapo-transpiration in summer.

Among different groups, the spices in increasing order of moisture stress tolerance are :²

Cereals	Kharif	rice, maize, pearl millet, sorghum, crow-foot, millet, rabi wheat, oat, barley
Pulses	Kharif	cowpeas, blackgram, greengram, soyabean, pigeon pea, cluster bean
	Rabi	lentil, peas, gram
Oilseeds	Kharif	groundnut, sesamum, castor
	Rabi	linseed, sunflower, saflower, mustard

(v) Different crops require different quantities of water supply throughout their growing period. For example, grain crops require their maximum supply during the time ear heads are formed; while sugarcane, cotton, chillies require more water. Most annual crops do not require water when they are maturing.

1. National Commission on Agriculture, *Interim Report of Modernising Irrigation System and Integrated Development of Command Areas*, 1973, p. 15.

2. *Ibid.*, p. 16.

The total water requirement of crops varies from 10.6 acre-inches for mustard, to 95.0 acre-inches for sugarcane. The water needs of other crops are : linseed 12.7 acre-inches ; barley 14.1 ; oats 14.4 ; wheat 14.8 ; maize 17.8 ; jowar 25.7 ; groundnut 26.1 ; potato 26.7 ; ragi 29.8 ; chillies 38.8 ; tobacco 39.2 ; rice 41.7 and cotton 42.2 acre-inches.¹

The ICAR Hand book gives the water requirements of some major crops as below :²

Water Requirements of Major Crops

Crop	Growing season (days)	Total water requirements (acre-inches)	Daily water requirements (acre-inches)
Rice	98	41.7	0.43
Wheat	88	14.8	0.17
Sugarcane	365	95.0	0.26
Cotton	202	42.2	0.21
Groundnut	124	26.1	0.21
Jowar	114	25.7	0.23
Potato	88	26.7	0.30

In addition to the above crops, the water requirements of deciduous fruit trees is about 30 inches ; and of citrus and evergreen trees, about 40 inches a year. Tough crops such as beans, lettuce, and water melons require about 16 inches of water, common feeder grasses about 24 inches and perennial legumes such as lucerne, berseem and clover about 36 inches of water per year³.

When the required quantity is not available through natural water supply, irrigation has to be resorted to.

(vi) The need for irrigation also arises from the fact that inspite of considerable advantages of the soil, sunshine and climate, crop production in India is not so efficient as in other parts of the world specially because of the lack of moisture in the soils. Sandy soils require frequent water than the alluvial or black soils. In dry season, enough residual moisture is not available in the soil to support multiple cropping. It cannot be over-emphasized than to state that "a sadder commentary on our economic situation cannot be found than the close, direct correspondence between harvests and mortality and the security of harvests depends primarily upon the adequate supply of water".⁴

1. Arakeri, H.R., and others, *Soil Management in India*, 1962, p. 226.

2. I.C.A.R. *Handbook of Agriculture*, 1969.

3. *Ibid.*, p. 224.

4. Mukherjee, R.K. (Ed.) *Economic Problems of Modern India*, Vol. I, 1939, p. 9.

(vii) Many of the Indian rivers are not perennial and carry insignificant flows in the rabi season. Besides, there is a wide disparity in water flow from year to year too. In the case of snowfed rivers in the north, the flows are normally perennial, but the variation between the winter and the monsoon flows may be as much as 1 to 100 in the main rivers traversing the plains and as much as 1 to 300 or more in small hill streams. The characteristic of central and southern rivers is that about 80 to 90 per cent of the annual run-off takes place during 4 months of monsoon rains, the rivers are largely dry during the remaining 8 months of the year. It is obvious, therefore, that to make use of a sizeable portion of the average annual run-off large storage capacities are needed. Through conservation of surface water, parched lands may be watered round the year so that multiple crops can be grown the year round. Fortunately, efforts have borne fruit in this respect. For example, Bhakra Dam on Sutlej conserves 45 per cent of the river flow and irrigates about 14.56 lakh hectares ; Nagarjunsagar on Krishna holds water to serve 8.90 lakh hectares ; Chambal dam serves 5.56 lakh hectares. Some of the other projects which serve and supply water through mere diversion structures on the perennial rivers are the Gundak which will supply water to 14.56 lakh hectares ; Kosi supplying 7.28 lakh hectares ; besides 3.23 lakh hectares on the Western Kosi Canal when it is completed. The Sone Barrage serves 2.83 lakh hectares. These storages have helped and will further help in moderating floods, preventing large-scale destruction of property, crops and life.

(viii) India has vast ground-water reserves specially in the Gangetic plain, Narmada basin and deltaic areas, that is in about 40 per cent of our country's sown area.¹ According to Dr. G.C. Chatterjee G.S.I.) that average annual rainfall in India is $3 \times 10^{12} \text{m}^3$, about $801 + (10^9 \text{m}^3)$ of water seeps down annually in the soil. Of the quantity seeping into the soil, only $370 \times 10^9 \text{m}^3$ of water percolates down to replenish the ground water body. The total storage of ground water down to 305 metres has been estimated at $37,000 \times 10^9 \text{m}^3$. We are still using only $22 \times 10^9 \text{m}^3$ of the ground water. Therefore, large scope exists for the development of these underground water resources.

(ix) India's total geographical area of 328 m. hectares lies in tropical and sub-tropical zones. The total culturable area is 256 m. hectares, and the net sown area in 1974-75 was 138 m. hectares and the gross cropped area (including area cropped more than once) was 164 m. hectares. At the beginning of the Fourth Plan only 23 per cent of the cropped area was getting irrigation, i.e. 77 per cent of cropped area exclusively depended on rainfall. Development of irrigation has,

1. Two American Scientists from Geological Survey of USA estimated that there are tremendous potentials of ground water in the Upper Gangetic Plain. U.P. and Bihar possess an underground lake which is probably the largest and potentially the most productive in the world.

thus a very important role to play in the growth of Indian agriculture, especially in unirrigated and dry areas.

(x) The total land area in the country under food crops is 118 m. hectares. There are 52.60 m. hectares in the Indo-Gangetic Plain (*i.e.* six states of Punjab, Haryana, Rajasthan, U.P., Bihar and West Bengal). In Central India (*i.e.* Gujarat, M.P., Maharashtra and Orissa), the sown area for foodgrains is 38.4 m. hectares ; while in Peninsular India (Kerala, Karnatak. Andhra Pradesh, and Tamil Nadu), the food crops are grown on 22.6 m. hectares. The productivity differs considerably from zone to zone and from State to State. While in Punjab and Tamil Nadu, a hectare yields as much as 800 to 1000 kg., in M.P. or in Karnataka the average yield of food crops is 500 kg per hectare. This disparity in food production is entirely due to differences in availability of water for the land either through rain or artificial supplies.

(xi) Lastly, in good rainfall areas (like Assam, W. Bengal, Orissa, Andhra Pradesh, Tamil Nadu and Kerala) irrigation is required mostly as a supplemental need to protect their single crop agriculture against occasional drought. In Karnataka, Maharashtra, Gujarat and Bihar too the predominant crops receiving irrigation benefits are that of paddy and to a lesser degree that of sugarcane, percentage of other irrigated crops being comparatively small. It is only in Punjab, Haryana, Rajasthan, M. P., Gujarat, and north-western U. P. where irrigation is used extensively for other seasonal crops as well.

Development of adequate and dependable irrigation facility is, therefore, very essential to banish famines as a result of drought conditions. Irrigation alone supplies dependable and timely supplies of water. In the absence of irrigation, the farmer cannot risk his investment in other inputs which contribute to increased productivity. Thus, irrigation has necessarily a crucial role to play in the country's agricultural production strategy.

It may, however, be noted that irrigation can yield best results only if it is accompanied by other factors such as suitable change in the cropping pattern, improving and maintaining the fertility of soils, use of improved varieties of crops, application of chemical fertilisers and green manuring, adoption of plant protection measures and improved cultural practices and many other allied matters. These will yield results only when sufficient water supply is available.

VITAL ROLE OF IRRIGATION

Irrigation has proved beneficial to the country. In fact it forms the datum line for sustained successful agriculture. It alleviates suffering, preserves life, averts famines and advances the material prosperity of the country. In fact, as pointed out by Sir Charles Trevelyan, "Irrigation is every thing in India. Water is more valuable than land, because, when water is applied to land it increases its productiveness

at least six fold and renders great extents of land productive, which otherwise would produce nothing or next to nothing."¹ Dr. Knowles writes, "The irrigation works have made security of life, they have increased the yields and the value of the land and the revenue derived from it. They have lessened the cost of famine relief and have helped to civilize the whole region. In addition, they yield handsome profits to the government."²

Dr. Gadgil's survey of the economic effects of the Godawari and Pravara Canals in Deccan has shown that the total direct and indirect effects of the irrigation projects were very favourable. Due to irrigation, farmers could make additional investments in cattle, farm implements and on more valuable crops like sugarcane and the total employment of the farmers and labourers was greater.³

Benefits of Irrigation

As a result of the studies undertaken in 1958 and 1961 in eleven projects from each of the regions,⁴ it was observed that "canal irrigation has helped in promoting the greater utilisation of land; enlarging the average size of the farm; generating demand for additional farm labour; shifted in new and better varieties of crops; increasing additional productive investment in farm business; favourable input-output ratio; widening the scope for increase in land revenue and other local receipts. In addition to direct benefits, there are also secondary and tertiary benefits, e.g., canal irrigation has led to a general expansion of secondary and tertiary activities in the area affected by it resulting in greater work opportunities; more employment to both family and hired labour; higher value of output per industrial unit, and higher turnover of business establishments in the project areas".

The purpose of irrigation is to help increase agricultural production from the lands served. The services provided by irrigation may be viewed from two angles, viz.

1. Observes Barnard Darley. "They have banished the grim spectre of famine and brought peace, prosperity and a higher standard of living to the whole country" in *Economics Problems of Modern India*, (ed. by R.K. Mukherjee), Vol. I, 1939, p. 167.

"The irrigation colonies have in fact opened an era of prosperity undreamt of in the past"—M.L. Darling, *Punjab Peasantry in Prosperity and Debt*, 1932, p. 119.

2. Knowles, *Economic Effect of British Empire Overseas*, Vol. I, pp. 367-68

3. D.R. Gadgil, *Economic Effect of Irrigation*, 1945, p. 173. Also see, W. Burns, *Technological Possibilities of Agricultural Development in India*, 1944, p. 57.

4. (i) Sarda Canal (Punjab/U.P. region) ; (ii) Ganga Canal (Rajasthan, M.P. region) ; (iii) Tribeni and Damodar Canal (Bihar, Orissa and N. Bengal region) ; (iv) Cavay-Mettur project (Southern regional-coastal) ; (v) Nizam-sagar project (Southern region-plateau) ; (vi) Bor project (Maharashtra) ; (vii) Nalangan project (Maharashtra) ; (viii) Morwe project (Bihar) ; (ix) Chandan project (Bihar) ; and Shetrunji project (Gujarat)—Planning Commission, *Criteria for Appraising the feasibility of Irrigation Projects*, 1964.

(a) *Protective aspect* to make up the moisture deficiency in soils during the cropping season so as to ensure proper and sustained growth of the crops grown.

(b) *Additional land use aspect* to enable a second or third crop being raised on the lands provided with irrigation which could otherwise not be cultivated efficiently more particularly during the post or pre-monsoon period. While the protective aspect helps to stabilise agriculture production against droughts, the second facility, i.e., overcoming low productivity due to dryness or excessive water supply.

"Irrigation development in India in the past had mostly taken place as a measure of drought relief. *Famines fathered the idea of artificial irrigation.* Irrigation work was built, designed and operated mostly on a defensive pattern. With the population swelling rapidly, irrigation has now to have a new purpose—increased agricultural production".¹

The yields in irrigated areas are said to be 60 to 100 per cent higher than in other areas. This is evidenced by the data collected by Dr. Gadgil, which are given below :²

Yields of Crops in India from Irrigated and Unirrigated Areas (In maunds)

Crop	Canal Irrigated	Dry Famed
Sugarcane	70	—
Jowar grain	8	3
Wheat	7½	3
Groundnut	20	8
Gram	5	3
Bajri grain	6	2
Cotton	3	1

Irrigation by helping the plant to take up the manure in a suitable form leads to increase in fertility and ultimately to increase in crop yields.

Demerits of Irrigation

Irrigation water when misused spoils the soil beyond repair. Mr. Pugh traces back the history and remarks that soil civilisation in the Middle East disappeared because of misuse of irrigation water.

1. Baleshwar Nath, "Irrigation," *Yojna*, Dec. 1965, p. 10.

2. Willam Stamp, "Irrigation from Groundwater for Stimulating Food Production in Dessert Areas," *Empire Journal of Experimental Agriculture* Jan. 1948, p. 46. D.R. Gadgil, *Economic Effects of Agriculture*, pp. 100-103.

Agricultural Reorganisation Committee U.P. (1949) pointed out that at some places yield of crop decreased due to irrigation water. This is due to : (a) greater demand on soil nutrients to produce higher yields ; (b) the leaching effects of irrigation ; and (c) collection of injurious salts in the lower layers of the soil.

The important fact to be noted is that whenever water is available to the cultivator for irrigation he invariably resorts to over-irrigation under the mistaken belief that the higher the application the higher the yield and also the feeling that he must make the fullest use of the water for which he has paid. Experimental studies undertaken by Shri A.P. Bhattacharya (in Sarda Canal area) have given convincing proof that over irrigation is harmful from the point of view of lowering of yields because the unused water not consumed by the plant brings down plant nutrients, while percolating to the ground water table, which keeps on being augmented ultimately leading to water logging which in its turn brings malaria along with complete loss of fertility. A rough estimate shows that the yearly loss to the country is of the order of Rs. 40 crores, apart from the long term effects of water-logging and malaria.

Other demerits of excessive irrigation are :

(i) *It causes water logging, etc.* Canal irrigation, however, suffers from a very serious defect against which it is very necessary to guard effectively. An abundant supply of water from the canals for irrigation does not only lead to a great waste of water but also what is more serious is that it causes waterlogging and salt effervescence. "Water-logging may be defined," says Professor Brij Narain "as the rise in the level of the subsoil water which renders land unfit for cultivation."

What happens actually is that the salts of the soil come up to the surface with the rise of the subsoil water level. The canals act in two ways in ensuring this phenomenon. *Firstly*, they intersect drainage lines and cause rain and flood water to be held up. *Secondly*, they cause their own water fall vertically until it reaches the spiring level. "If the subsoil outflow is not enough to balance the inflow, the spiring level rises being drawn up by capillary attraction and all the salts of the earth come to surface and make the land unfit for crops." This causes the soil to deteriorate by bringing out *alkali* or *reh* to the surface of the soil.

The remedies usually suggested for this phenomenon are : (a) Pumping out of water by tube-wells and other methods of drainage, (b) Proofing of canal beds by concrete, (c) Opening out of closed and obstructed drainage, (d) Replacing canal irrigation by well irrigation, (e) Prevention of over-irrigation, by forcing the cultivator in economise water, (f) Attempts should be made to change the time of supplying canal water and that the beds and sides of canal

should be rendered impervious *inter alia* treating them with sodium carbonate.

(ii) *They have created unhealthy conditions.* Canal irrigated areas have shown susceptibilities to encourage malaria with its very harmful and pernicious effect on the health of the peasants and the village folk. In order to safeguard against this, the Royal Commission recommended that "careful drainage surveys should be made in future in all irrigation projects and drainage maps should be prepared." Sir John Russel also emphasised the urgent need for proper soil surveys and agricultural analysis. "It may be laid down as an absolute rule that no irrigation scheme should ever be carried out until a proper soil survey of the region has been made. Barley one-half of the water delivered at the head of the canal reaches the field."

DEVELOPMENT OF IRRIGATION

Irrigation in India has been practised from ancient times and irrigation tanks and wells are a familiar feature of the Indian landscape to supplement and conserve the rainfall.¹ Provision of water for cultivation had figured prominently among the duties enjoined on the rulers of the land, who undertook the construction of irrigation works as benevolent works and many of the works of the ancient times owe their existence to the munificence of kings and philanthropists.

Ancient India. Ancient Indian civilization mostly developed in the river valleys which were well equipped with irrigation system, which helped in the growth of food crops and cotton. Vedas refer to *avata* or water wells, *kulya* or Canal, and *sarsi* or dam indicating the fact that devices for irrigating land were already known. Manu mentions about *tataka* or artificial storage. Mahabharata contains indications of the practice of irrigation from wells, tanks, and canals. Kautilya observed, "If privately managed dams are neglected for 5 years, their charge is taken over by the State. If they are constructed by public contribution, revenue is to be remitted for 5 years. If only repairs are carried out by public effort revenue is to be remitted for 4 years." Classical literature is replete with water courses—*pranadi*, *kulya*, *nala*, *naliha*, *tilamaha*, etc.

Lord Buddha refers to irrigation in *Dhammapada* thus

"Irrigation leads the waters
Fletcher fashion the shafts
Carpenters bend the wood
The wise control themselves".

Artificial lakes and canals that dot the country in hundreds, are centuries old, and some of them have served for more than a

1. *Report of the Royal Commission on Agriculture*, para 268.

thousand years. Megasthenes (4th century B.C.) mentions that the whole country is under irrigation and very prosperous because of the double harvests which they were able to reap each year because of irrigation. "Storages and their water courses are common in south, central and eastern India. The first structure, a weir built in stone and clay, was probably laid in the 2nd century A.D. This Grand Anicut was built across the Cauvery, about 330 m. long, 12 to 18 m. wide and 4.6 to 5.5 m. high. The anicut has serviced irrigation and withstood the annual Cauvery floods for more than 1600 years." It was later remodelled by the Britishers in the 19th century.

History is replete with a mention of various types of tanks, dams and canals built from time to time, such as :

Name	Period of construction
Almanda tank	(circa 11th century A.D.)
Rāja-talaka	(circa 11th century A.D.)
Sindhuvalli tank	(1106-1107 A.D.)
Periyaverakkal-sluice	(circa 1219 A.D.)
Porum ammilla tank	(1369 A.D.)
Hari dra dam	(1410 A.D.)
Narasambuthi tank	(1489 A.D.)
Nagalapur tank	(circa 1520 A.D.)
Korragal & Basavanna channels	(1521 A.D.)
Sivasamudra	(1531-32 A.D.)

During the Mughal Period. Irrigation development received great attention during the Pre-Mughal and the Mughal periods. The western Jamuna Canal (of Firoze Shah Tuglak) brought water to Delhi in the 14th century. It served as an irrigation canal in the tract it traversed. The Bari-Doab canal was executed by Ali Mardan Khan in the middle of the 17th century. The Eastern Jamuna canal was laid down in the region of Mohammed Shah during the middle of 18th century.

During the British Period. The British inherited a tradition of irrigation in India. The Indian Irrigation Commission of 1901-03 recorded, "Be this as it may, it is certain that it was the existence of the Grand Anicut in Madras, and the remains of old Mohammedan channels in the Punjab and United Provinces, which suggested and led to the construction of the earliest works carried on under British rule. India, therefore, in a great measure owes to her former rulers the first inception of the present unrivalled system of irrigation works".

Initially, during the British period, Western Jamuna and Eastern Jamuna canals were renovated and remodelled followed by the construction of the Cauvery delta system in conjunction with the Grand Anicut. A masonry weir across the Coleroon, was constructed in 1836. The Upper Ganga canal was commenced in 1842 and completed in 1854 by P. Coutley. This was followed by other canals like the Lower Ganga, the Agra and the Betwa canals in U.P., the Sirhind canal in the Punjab, Mutha canal in Bombay, and the Periyar canal in South India. Other notable works were the weirs across the river Godawari near Rajmahendry, and across the river Krishna near Vijaiwada. Along with their canal systems they led to the irrigation of the fertile Godawari Krishna-deltas. Occurrence of very serious famines towards the later part of the 19th century led to the development of the Indian Irrigation Commission in 1901 to report on irrigation as protection against famines in India. This gave further impetus to irrigation projects, and led to a number of projects like the Triple Canal Project in the Punjab, the Godawari canal in Bombay and the Tribeni canal in Bihar.

Further works were taken up after the First World War, notable example being the Mettur, Nizamsagar and Krishna Raja-Sagar projects, the Periyar canal, the Khadakvasla storage dam, Pravara and Nira canal in the South and the Ganga canal and the Sardar canal in the north. Besides these major systems, a large number of medium and small irrigation works like tanks and canals were also constructed all over the country. This led to substantial increase in irrigation and food production.

Pre-Independence Period. During the depression of 1930's and the Second World War, little development took place in the field of irrigation. The partition of the country resulted in major irrigated areas going to Pakistan. Partition resulted in a substantial reduction in the proportion of irrigated area to 20 per cent of the cultivated area. On the eve of Independence there were 22.6 m. hectares receiving irrigation, which constituted 24 per cent of the net cultivated area in undivided India. Of the total volume of water carried by the canals in undivided India the canals in Pakistan received 81,400 m. cu. m. of water against 11,000 m. cu. m. of water used by India in the Indus basin. In terms of irrigated area about 8 m. hectares of land went to the share of Pakistan, against only about 2 m. hectares left in India. This further necessitated the growth of irrigation potential.

WATER RESOURCE POTENTIALS

India is blessed with one of the largest water supplies of any country in the world.¹ Her total resources are abundant, as India is endowed with a large number of perennial rivers and tributaries that traverse the length and breadth of the country.

1. *Ford Foundation Team Report on India's Food Crisis and Steps to Meet It*, 1959, p. 142.

India has an annual precipitation of 400 m. hectare metres. According to the National Commission on Agriculture, "the total annual basic water resources are 185 m. hectare metres, comprising 135 m. hectare metres of surface water and 50 m. hectare metres of ground water resources. On full development the total annual basic ground water resources would increase to 85 m. hectare metres and the surface water 185 m. hectare metres including 45 m. hectare metres regenerated from groundwater. Besides some credit can be taken for underground fossil water, surface flows from glaciers and permanent snows and expensive desalinated water from the sea."

"The usable flows aggregate to about 105 m. hectare metres — 70 m. h. m. from surface sources and 35 m. h. m. groundwater. Not all of this water is available exclusively for irrigation as there are other demands on it like municipal and industrial needs. It is expected that by 2025 AD about 77 m. h. m. would be available for irrigation."

"With all the changes envisaged in the pattern of land use, the net sown area is expected to increase from 140 m. hectares in 1970-71 to 150 m. hectares in 2000 A.D. and 155 m. hectares in 2025 A.D. The total cropped area is expected to increase from 165 m. hectares to 200 m. hectares and to 210 m. hectares during these years. The ultimate irrigation potential is assessed at about 110 m. hectares (*i.e.* 52 per cent of the gross sown area of 210 m. hectares). Of this, about 70 m. hectares will be irrigated from surface sources and 40 m. hectares from groundwater."¹

There are 14 major river basins, each with a drainage area of more than 20,000 sq. km. and 44 medium basins of 2,000 to 20,000 sq. km. catchment. The total water in all the river systems in India has been roughly estimated as 16,45,000 m. cu. metres. The Ganga and Brahmaputra carry 61 per cent of the total water and only 20 per cent of Indus waters.

Most of the irrigation by river waters is provided by gravity flow by canals taking off from barrages or dams across the rivers. Pumping is also being adopted to lift the waters from river on to the land. Permanent head-works have also been replaced by floating pump-houses. This reduces the period of construction and cost. Dalama and other floating stations on the Ganga are excellent examples where waters sufficient for 50,000 hectares and more are being supplied.

1. *Abridged Report of the National Commission on Agriculture, 1976, pp. 186-187.*

The following table gives an idea of the annual run-off of the Indian rivers.

River System	States	Drainage	Annual Run-off
1. Indus along with Sulej, Beas, Ravi, Chenab and Jhelum	Jammu and Kashmir, Punjab, H.P.	354,830 sq. km. (or 137,000 sq. miles)	79,473 m. cu. metres (or 64.43 m. acre feet)
2. Ganga along with Jamuna, Ghagra, Chambal, Gandak, Kosi and Sone	U.P. Rajasthan, M P. Bihar, W. Bengal.	976,340 sq. km. (or 377,000 sq. miles)	489,397 m. cu. metres (or 397 m. acre ft.)
3. Brahmaputra alongwith its tributaries,	N.E. State of Assam	506,241 sq. km. (198,460 sq. m.)	381, 145 m. cu. metres (or 309 m. acre ft.)
4. Narmada and Tapi	M. P., Maharashtra, Gujarat	152,162 sq. km. (158,750 sq. m.)	57,110 m cu. metres (or 46.3 m. acre ft.)
5. Mahanadi	M.P., Orissa	132,789 sq. km. (51,270 sq. m.)	92,819 m. cu. metres (or 75.25 m. acre ft.)
6. Godavari, Krishna, Cauveri	A.P., Karnataka, Maharashtra, Tamil Nadu.	648, 795 sq. km. (250, 500 sq. m.)	180,458 m. cu. metres (or 146.3 m. acre ft.)

Upto 1951, about 93,734 m. cu. metres of water representing about 14 per cent of the usable flow or 6 per cent of the total annual flow had been utilised. By the end of the Second Plan, the utilisation had risen to 148,017 m. cu. metres representing 27 per cent of the usable flow or 8.9 per cent of the total annual flow. At the end of the Third Plan, about 185,022 m. cu. metres representing 33 per cent of the usable flow or 12 per cent of the total annual flow was utilised. There is still scope for utilising about 370,044 m. cu. metres of water for irrigation projects. A number of projects under construction which on completion will utilise another 123,300 m. cu. metres, bringing the total to 308,300 m. cu metres of water.

Underground Water Potential

From the data available it may be noted that a colossal amount of water equal to one-third of the total precipitation, is lost through evaporation ; and *secondly*, only a meagre amount of the total annual

rainfall seeps into the ground and is available for recharge, which feed the open wells and tubewells. The surface river-flow during monsoon period may also be utilised by making dams from which channels may be taken out for the dry weather crops.

A large number of reservoirs have been constructed in India before and during the planning era. Before Independence, the largest in India was the Mettur reservoir across the Cauvery with a live storage capacity of 2,600 m. cu. m. There are now ten reservoirs of much larger capacity, the largest being 7,400 m. cu. m at Bhakra. In 1951, the effective storage in reservoirs amounted to about 12.3 thousand million cu. m. and this had risen to about 61.7 thousand million cu. m. by the end of the Third Plan. When all the projects are taken up, the storages in reservoirs would be about 135.7 thousand million cu. m. In addition to this, water is being utilised from run-off the river schemes. The total utilization from storages and diversion works is estimated to rise to about 247 thousand million cu. m. by the end of the Fourth Plan.

The surface water is utilised for irrigational purposes through impounding of water in tanks and reservoirs ; building bunds, weirs and regulators across the running streams ; and diverting water on either flanks of the streams, such as anicuts, bandharas ; and lift irrigation from streams and drains.

India is rich not only in surface water but also in underground water, which is precious reserve store. The availability of ground water is determined not only by local rainfall or snowfall but also by geological factors which show wide variation from place to place. There are pockets of aquiferous layers scattered all over India at different depths. There are at least three ground water basins in India : (i) The Ganga basin, (ii) Punjab alluvial basin, stretching from Ludhiana to Amritsar, and (iii) Western basin, covering that part of Rajasthan which lies north of 28° parallel and curving southward to Gujarat plains as far as Ahmedabad.¹ The flow of ground water supply in these basins is not substantial because of the flat terrain. Of these three, the Ganga basin is the largest. This underground water supply is and can be tapped by open shallow percolation wells, kutchra or pucca - boring or deepening of wells, and installation of water lifting appliances like pumping sets, persian wheel, and tube wells.

The exploratory surveys were undertaken by the Groundwater Exploration project (1953) in the Indo-Gangetic basin, and the Sabarmati basin. In the Gangetic plain, the sub-surface material is pervious up to a depth of 9.1 to 12.2 m. which makes it ideally suited for the creation of underground reservoirs. The sandy beds of the

1. *The Gazetteer of India*, 1965, p. 11.

non-perennial streams of the Ganga basin which carry heavy flood discharge in the monsoon have large aquifers below them. These aquifers could be de-watered by a chain of irrigation tube wells. Nearly 15,000 tube wells have been sunk, serving one million hectares.

Besides, the porous sand stones of the Himalayan foothills with their synclinal provide ideal conditions for artesian water, and within this belt there is considerable scope for establishing a large number of flowing wells. The artesian conditions are also fulfilled along the edge of the Narmada valley to the north of the Satpura range where water bearing conglomerate beds are overlain by low ridges of impervious crystalline rocks. "In Gujarat an artesian zone also occurs at a great depth 270—370 metres below ground level, the maximum recorded yield of water in a well at Viramgaon being 114,000 litres per hour. The Maharashtra lava plateau contains ground water in cracks and fissures in the neighbourhood of rivers and streams; more so, in the withered portions of the trap rock which get saturated with water and retain it wherever it is circumscribed by fresh trap. Laterites and inter-trapped beds also serve as good aquifers in the trapper country."¹ These sources can conveniently be tapped in these areas. Tamil Nadu and Andhra Pradesh also offer favourable scope for groundwater development in the alluvial regions of the delta mouths of river systems like the Godavari, Krishna and Cauvery. The yield of wells in these regions is substantial. In all, about 93,600 sq. km. have proved ground water worthy and potential created in terms of number of tube wells is 24,600.

There is a wide disparity in the availability of water resources in different states. The percentage of gross area sown that can be ultimately irrigated ranges between 17 per cent in H.P. and 85 per cent in Punjab. This percentage for other states is : Andhra Pradesh 58, Bihar 82, Gujarat 34, Haryana 64, Karnataka 41, M.P. 32, Maharashtra 26, Orissa 64, Rajasthan 31, Tamil Nadu 40, U.P. 84 and West Bengal 43.¹

PROGRESS OF IRRIGATION

It would be of interest to know that the irrigated area increased from about less than a million hectares in 1800 to about 5 m. hectares in 1900 and 17 m. hectares in 1925. At the beginning of the Plan period (1951), the area under irrigation was of the order of 22.6 m. hectares. If the water resources could be put to proper use, irrigation facilities can be brought to nearly 82 m. hectares. At the end of 1969-70, about 37.68 m. hectares of land was irrigated by 1973-74, 44.1 m. hectares was irrigated and by 1976-77, the total irrigated area

1. *Ibid.*

rose to 47.0 million hectares. Up to 1951, 9.7 m. hectares of land was irrigated by major and medium projects, and 6.4 m. hectares by minor irrigation works. In addition, 6.5 m. hectares were being irrigated by ground water use. At the beginning of the Fourth Plan, it was estimated that about 24 m. hectares was under irrigation, 16.9 m. hectares under major and medium, and 7.1 m. hectares under minor irrigation schemes. Minor irrigation using ground water increased to 12.0 hectares during the same period.

Up to 1951, 9.7 million hectares of land was irrigated by major and medium projects, which existed before independence, like the Upper and Lower Ganges Canal and the Agra Canal in U.P., the Upper Bari Doab and the Sirhind Canal in the Punjab ; the Godavari and Krishna system in Andhra ; the Cauvery in Madras ; Mutha Canals in Maharashtra and Mahanadi Canals in Orissa etc.

Up to 1966, an irrigation potential of 7.3 m. hectares was created by various major and medium irrigation projects. This achievement during 1951—1966, was 75 percent of the achievement during the preceding 100 years. A number of mammoth projects were undertaken and completed such as the Bhakra project in the Punjab, the D.V.C. in Bihar and West Bengal, Hirakud in Orissa, Matatila in U.P., the Tungbhadra in Mysore and Andhra, the Kosi in Bihar, the Malampuzha in Kerala, Nagarjun Sagar, Purna, Bhadra, Chambal, Rajasthan canal, Kangsabati, Prambikulam Aliyar, and Mahanadi delta canals.

The following tables give the gross and net irrigated areas in India since 1950-51 :¹

Gross Irrigated Areas

Year	(Million hectares)	Year	Million hectares)
1	2	3	4
1950-51	22.6	1967-68	33.2
1955-56	25.6	1968-69	35.4
1960-61	28.0	1970-71	38.7
1965-66	31.7	1971-72	38.9
1966-67	32.7	1972-73	39.0
		1973-74	42.2

1. *Agriculture in Brief*, 1976.

Net Irrigated Area

Year	(Million hectares)	Year	(Million hectares)
1950-51	20.9	1970-71	31.4
1955-56	22.8	1971-72	31.8
1960-61	24.7	1972-73	31.9
1965-66	26.3	1973-74	42.2
1966-67	26.9	1974-75 to	
1967-68	27.2	1977-78	47.8
1968-69	29.0	(expected	

At the end of the Fifth Plan, the total irrigation potential, created through major and medium irrigation projects would be about 25 m. hectares against the ultimate irrigation potential of 57 m. hectares, leaving a potential of 32 m. hectares to be created in the future plans.

The following table indicates the position :

Development of Irrigation Potential
(Million ha)

Item	Ultimate Potential	1950-51		1968-69		1973-74		1974-75 to 1977-78	
		Potential	Utilised	Potential	Utilised	Potential	Utilised	Potential	
1. Surface Water									
(a) Major and Medium	57	9.7	9.7	18.1	17.0	21.4	19.6	43.5	
(b) Minor	15	6.4	6.4	7.0	7.0	7.5	7.6	4.3	
<i>Total</i>	72	16.1	16.1	25.1	24.0	28.9	26.1	47.8	
2. Ground Water	35	6.5	6.5	12.0	12.0	16.0	16.0	—	
<i>Grand Total</i>	107	23.6	22.6	37.1	36.0	44.9	42.2	47.8	

According to the Planning Commission, "Irrigation potential created by a project at a given time during or after its construction is the aggregate gross area that can be irrigated annually by the quantity of water that could be made available, by all connected and

completed works up to the end of water course, or the last point in the water delivery system.

On the other hand, "the irrigation potential utilised" is the total gross area actually irrigated by a project during the year under construction.

The plan-wise progress of irrigation potential created and its utilization, from major and minor irrigation scheme is given below :

*Irrigation benefits from major and medium Plan schemes
(m. hectares)¹*

At the end of	Cumulative Irrigation Potential created by projects	Cumulative utilization from plan projects	Percentage utilization
First Plan	2.48	1.48	60
Second Plan	4.63	3.35	72
Third Plan	6.83	5.47	80
Three Annual Plans	8.43	7.00	83
Fourth Plan	11.69	9.85	84

While the rise in national average is encouraging, however, from the table given below will be seen that 52 per cent of the lag noticed at the end of the Fourth Plan has occurred in the eight major projects :

*Projects having Substantial Lag in Utilisation of
Irrigation Potential²*

(Thousand ha)

Sl. No.	Project	Ultimate irrigation potential	Potential created to end of 1973-74	Potential utilised to end of 1973-74	Gap in utilisation of poten- tial
1	2	3	4	5	6
1.	Kosi (including Rajpur Canal)	559.0	406.0	231.5	174.5
2.	Chambal (stages I & II)	262.0	262.0	182.0	8.00
3.	Gandak	1459.4	646.5	237.4	409.1

1. *Bhagirath*, Vol. XXII, No. 1, January, 1975, p. 7.

2. *Bhagirath*, Vol. XXI, No. 2, 1974, pp. 44-48.

1	2	3	4	5
4. Kokrapar	228.0	228.0	140.0	88.0
5. Tungbhadra (High and Low level Canals)	155.6	118.1	75.4	47.2
6. Rajasthan Canal	597.0	287.0	223.0	64.0
7. Kangsabati	401.6	203.0	143.0	59.8
8. Mahi Stage-I	186.3	12.12	82.2	39.0
Total				957.1

The findings of the Committee of Ministers (1973) are that under utilisation is caused by inadequate planning of the project or inadequate provision of one or more of the essential ingredients for irrigated agriculture. Excessive use of wastage of water and inefficient distribution system are also responsible for it. Other causes, according to this Committee for the lag in utilization, are :

(i) Construction of field channels not keeping pace with water availability facility.

(ii) Inadequate drainage facilities which hamper the development of irrigation.

(iii) Inadequate preparation of land for irrigated agriculture, like land levelling, shaping, etc.

(iv) Slow progress in the matter of consolidation of land holdings.

(v) Anticipated crop pattern and water allowances under the projects not being utilised.

(vi) Lack of adequate agricultural experimental and demonstration farms and training and extension facilities.

(vii) Mal-distribution of available supplies and absence of a roster system for equitable supply of water to the farms.

(viii) Lack of inputs and infra-structure facilities.

(ix) Neglect of proper operation and maintenance of the irrigation and drainage systems.

Expenditure on major and medium projects has been of the

progressive order, as would be clear from the following table.¹

Plan outlay and additional Irrigation Potential Created

Period	Outlay (Rs. Crores)	Additional Potential Created (Million Hectares)
Pre Plan	80	9.7
First Plan (1951-56)	300	2.5
Second Plan (1956-61)	380	2.1
Third Plan (1961-66)	576	2.3
Annual Plans (1966-69)	435	1.5
Fourth Plan (1969-74)	1253	3.0
1974-75	385	0.8
1975-76	493	1.01
1976-77	684	1.07
1977-78	906	1.47
Total (1974-78)	2,466	4.3

Out of the total irrigation potential of 6.2 m. hectares to be created during the Fifth Plan, the continuing schemes (75 major and 155 medium schemes) account for 5.5 hectares and 0.7 m. hectares will become available from new schemes (109 major and 313 medium schemes). The utilisation is expected to be about 5.2 million hectares. The strategy under the Fifth Plan was : (i) to achieve a substantial increase in the creation of irrigation potential consistent with the relevant organisational and financial capabilities and having regard to the needs of the drought prone areas ; and (ii) improvement in the utilisation of the created potential and efficient management of water and land for achieving maximum productivity². On-going projects will be completed on which construction work has progressed sufficiently. Some new schemes will have to be taken up to maintain the tempo of irrigation development in the Sixth Plan.

For the Five Year Plan (1978-83), the gross irrigated area is expected to grow from 48.41 m. hectares in 1977-78 to 63.41 m. hectares in 1982-83, i.e., at an annual compound growth rate of 5.54 per cent during the Plan period ending 1982-83 as against a growth rate of 3.18 per cent during the period 1961-62 to 1973-74. During this Plan, Rs. 7,250 crores will be provided for major and medium projects and Rs. 1,725 crores for major projects.

1. *Report of the Ministry of Agriculture and Irrigation*, Department of Irrigation for 1974-75, p. 25; and *Draft Fifth Five Year Plan*, Vol. II, 1974.

2. *Ibid.*, p. 106 ; *Draft Five Year Plan*, 1978-83, 1978, p. 134.

From 1978-79 a new classification of irrigation water will come into force :

- (a) *Minor schemes*, those with culturable command areas upto 2,000 hectares.
- (b) *Medium schemes*, those with culturable command areas about 2,000 upto 10,000 hectares.
- (c) *Major schemes*, with culturable command areas more than 10,000 hectares.

More emphasis will be placed on the development of minor irrigation works. For this purpose, adequate surveys will be undertaken for groundwater exploitation ; conjunctive use of ground and surface water ; renovation of tanks and extension support.

For accelerating the tempo of irrigation development, a target creation of additional potential of 8 m. hectares is envisaged.¹

SOURCES OF IRRIGATION

It may be noted that the systems of irrigation developed in different parts of the country is governed by local, meteorological, geological and other physical conditions. Therefore, there cannot be any uniformity in the system of irrigation in different tracts. Alluvial tracts in the Gangetic and coastal plains is especially suited for canals and wells : in crystalline areas of the Deccan plateau irrigation from tanks is most extensive and in the northern parts and black cotton tracts of Deccan, submontane regions of the eastern and western sides of the Western Ghats and the Punjab, a considerable proportion of land is irrigated by wells.

Of the area irrigated, more than half depends for its irrigation supplies on minor works. Rest of the area is irrigated from river-canal, their distributaries and channels, all of which are included under medium and major irrigation works.

The following table shows different sources of irrigation available in India:

Irrigation Sources (Land irrigated in 000 hectares)

Sources	1950-51	1955-56	1960-61	1965-66	1966-67	1969-70	1970-71	1971-72	1973-74
Canal	8,295	9,385	10,353	10,960	11,355	12,286	12,417	12,776	13,085
Tanks	3,613	4,423	4,561	4,270	4,570	4,417	4,537	4,123	5,920
Wells	5,978	6,739	7,284	8,653	9,478	11,189	11,834	12,034	13,224
Other sources	2,967	211	2,436	2,437	2,075	2,514	2,404	2,601	2,450
Total Net Irrigated area	20,853	22,758	24,634	26,353	27,478	30,406	31,292	31,534	32,549
Gross Irrigated area	22,563	25,624	27,951	30,879	32,650	37,328	38,552	38,592	39,087

1. *Draft Five Year Plan, 1978-83* (1978), p. 135-137.

From the above table it may be inferred that the area irrigated is served by canals, tanks, wells and other sources. The largest source of irrigation is canals, providing 40.9 per cent of the water to the total irrigated land. This is closely followed by wells, with 40.8 per cent. Tanks supply a comparatively small proportion (11.3 per cent). Other sources are of minor importance, with only 7.0 per cent. The percentage from these sources, over the years, has been as follows :

Percentage Share of different Sources in Irrigation

	1950-51	1955-56	1960-61	1965-66	1970-71	1971-72	1972-73
Canals	39.8	41.3	42.1	41.6	40.0	40.5	40.9
Tanks	17.3	19.4	18.5	16.2	14.5	12.5	11.3
Wells	28.7	29.6	20.6	32.8	37.8	34.1	40.8
Other sources	14.2	9.7	9.8	9.4	7.7	13.9	7.0
Total ...	100.0	100.0	100.0	100.0	100.0	100.0	100.0

State-wise the highest percentage of irrigation is in Punjab (72.5), Haryana (43.9), Tamil Nadu (42.7), U.P. (40.4), Jammu & Kashmir (37.4), while the states of Madhya Pradesh (8.9), Maharashtra (8.1), Karnataka (13.3), Gujarat (13.0) are the least irrigated. This leads to an obvious conclusion that there are limitations to irrigate all States to the extent of 70 per cent as in the Punjab. The extent of irrigation in a state depends upon the facility to supply irrigation at a price farmers can afford to pay and an infrastructure capable of producing irrigation.

(The State-wise irrigation area is given in Appendix B).

Taking the crop-wise use of water supply, the following table would reveal that they are in diminishing percentage, rice being highly irrigated followed by wheat. Others in importance are pulses, sugarcane, cotton, oilseeds and fruits and vegetables.

Irrigated Crops (% of the total)

Crops	1950-51	1955-56	1960-61	1965-66	1970-71	1972-73
Rice	43.8	43.0	44.7	41.8	38.7	37.0
Wheat	15.1	16.2	15.1	17.5	25.5	27.5
Jowar	2.0	2.4	2.3	2.3	1.6	1.4
Pulse	8.6	7.7	6.8	5.7	5.2	4.5
Sugarcane	5.2	5.0	6.0	6.5	5.0	4.8
Cotton	2.0	3.3	3.4	3.4	3.3	4.2
Oilseeds	—	1.1	1.5	1.7	2.7	2.6
Fruits and vegetables	—	0.5	1.7	1.9	2.5	2.5
Other Crops	11.6	8.9	7.0	6.7	5.5	5.7

MAJOR AND MEDIUM IRRIGATION WORKS

During 1950-51 and 1973-74, 97 major and 513 medium irrigation schemes were taken up. Of these 22 major and 358 medium schemes were completed and the rest spilled over to the Fifth plan. During Fifth Plan, 64 out of 75 major and all the 155 medium schemes will be completed. Besides, work will be initiated on 109 major and 313 medium irrigation schemes. The total investment on major and medium irrigation projects between 1951-52 to 1976-77 was Rs 4595 crores, and that for the Fifth Plan being Rs. 3,135 crores. The outlay for 1977-78 is Rs. 989 crores.

Progress of Major and Medium Irrigation Projects¹

Year	Potential (m. hectares)	Utilization (m. hectares)	Outlay Rs. Crores (Cumulative)
Beginning of First Plan	9.7	9.7	80
1951—1956	12.1	10.9	380
1956—1961	14.3	13.1	760
1961—1966	16.5	15.0	1336
1966—1969	18.1	16.7	1776
1969—1974	20.6	18.7	3023
1974—1979	23.5	20.8	3135

The importance of major and medium irrigation works lies in the conservation of the surplus and flood waters. Mere concentration on minor irrigation schemes would lead to a great waste of total usable water that is yet untapped. Only major and medium projects can be utilised as a safeguard against floods and these alone can be developed as Multi-purpose Projects which may serve not only the purpose of irrigation but also that of water power generation, supply of domestic water, navigation, fish culture and recreation facilities.

But major and medium irrigation projects, at the same time, suffer from certain drawbacks. A large number of pre-requisites are needed for their successful implementation. *Firstly*, they need a vast amount of capital expenditure for purchase of land, construction of dam, surface storage and provision of distribution channels and require money for resettlement of the ousters from the areas that may be submerged under the dams. *Secondly*, the loss in distribution system. When distributaries are not lined amount to about 40 per cent of the total water left in the channels. *Thirdly*, a large area might suffer from the problems of water-logging, needing vast amount of money for reclamation purposes. *Fourthly*, the catchment area

1. Bhagirath, Vol. XXII, No. 2, April, 1975, p. 71; India, 1977 & 1978, p. 226.

of the dams needs protection from soil erosion, otherwise the dam may be silted very soon and go out of use. *Fifthly*, such schemes involve more time in investigation, planning and construction and the gestation period is even large. *Finally*, they are less reliable for timely supply of water. As a result of all these factors the major and medium irrigation projects can be undertaken by the Government itself.

Minor Irrigation Works.

Minor irrigation programmes relate to the development of ground water resources on scientific lines. Such programmes include : (i) surface water schemes such as small stream diversions ; (ii) rain storages in small catchments, generally located on small streams on tributaries of rivers ; (iii) renovation of existing tanks and diversion works ; (iv) ground water tapping through construction of open wells, boring of wells for augmenting supplies, deepening of wells in rocky areas by pneumatic blasting, sinking of tube wells of various capacities ; lifting of water from the wells through large-scale installation of water pumpsets in place of the old country methods of water lifting such as counter poise lift and rope and bucket lift. (v) construction and repair of small drainage channels, embankments for flood protection and head water tanks, percolation tanks *ahars*, *bundhies*, for conserving moisture and replenishing groundwater.¹

The minor irrigation schemes have the great advantage in that they yield results promptly. (i) They can be conceived and completed quickly and handled to a large extent by the cultivators themselves (ii) They need small outlay of capital and mostly use local talents and resources. (iii) The utilisation of the irrigation potential is almost immediate. (iv) Since these works are owned by the cultivators themselves, they bring major satisfaction of the psychological and the physical needs of the cultivators: (v) Since the cultivators know fully the capacities of these works, water supply from these can be more reliable, so that they may adopt a cropping pattern to suit their needs. (vi) As the utilization of water in these cases is usually confined to the area very near to the sources, loss of water and its distribution is very much reduced. (vii) These are essentially people-centred programmes which provide scope for individual as well as co-operative efforts. (viii) The cost per hectare of minor irrigation is lower than in major irrigation. Tubewells as a major component of minor irrigation are far more reliable than storage schemes. (ix) Ground water has the great advantage in that it is doubtful and can be freely stored and freely move under ground so that the loss by evaporation and seepage both during storage as well as during conveyance. (x) Minor irrigation system does not require a large army of men to maintain and operate it.²

1. *Report of the Working Group for Formulation of Fourth Five Year Plan on Minor Irrigation*, pp. 6-10.

2. P.V. Shenoi, *op. cit.*, p. 175.

It is of interest to note that though in certain areas, major and medium irrigation schemes may be more feasible, there are others where minor irrigation schemes would be more beneficial such as in the contiguous patches of cultivated land available in undulating areas and rocky terrain, and are generally small. There are yet other areas where major, medium and minor schemes have to play a complementary role to perform. Thus, in areas allocated to High Yielding Varieties of seeds minor irrigation schemes have been accepted as complementary to major schemes. It is for this reason that emphasis has been, under the Fourth Plan, to develop minor irrigation schemes.

However, minor irrigation schemes do suffer from certain defects: (i) Except diversion schemes, all minor irrigation schemes have a certain span of life. Tanks gradually lose their irrigation capacity as a result of silting. (ii) The discharge of tube-wells generally reduce as a result of gradual deterioration of strains. (iii) Mechanical appliances have to be replaced after 10 to 20 years. (iv) It is difficult to have any precise assessment of the area lost by depreciation. (v) The surface storage schemes, if they are located in high areas tend to be unreliable if rains fail.

Progress of Minor Irrigation Schemes

There were about 5 million open wells and only 3000 to 4000 tube wells in the country at the beginning of the First Plan, since then phenomenal progress has taken place.

The number of wells increased from 3.64 million in 1956 to 5.11 million in 1966 and further to 6.10 million in 1971. Easy credit from institutional sources, expansion of rural electrification and profitability of farming as a result of the introduction of high yielding varieties, encouragement of multiple cropping and an incentive oriented price policy were the main contributory factors.¹ More than 70 per cent of the open wells in March 1969, were operated with indigenous lifting devices and less than 30 per cent were fitted with pumps.

In March 1969, there were 261,000 irrigation tube-wells in the country, including 15,000 State tube-wells. Most of the tube-wells are privately owned. The deep tube-wells, because of the high cost involved, are best undertaken by the State : while shallow ones are owned by private persons. The number of shallow tube-wells went up from 245,000 in 1968-69 to 782,000 in 1973-74. The number of pump sets (both electric and diesel operated) is estimated to have gone up from 16.1 lakhs in 1968-69 to 41.3 lakhs in 1973-74. During 1974-76, about 3.6 lakhs dug wells and 2.6 lakhs tube-wells were constructed and 4 lakh diesel pump sets and 2.6 lakh electric pump sets were installed, benefiting an area of about 17 lakh hectares.

¹. *Abridged Report of the National Commission on Agriculture, 1976*, p. 188.

The area irrigated by minor schemes, prior to planning, was 12.9 m. hectares. Against a cumulative target (during first Three Plans), of 13.27 m. hectares, the achievement was to the extent of 12.60 m. hectares. About 60 per cent of this increase was contributed by new irrigation, the rest being in the nature of supplemental irrigation, stabilization of existing irrigation, benefits from drainage and embankments. The gross area irrigated from minor schemes was 16.4 million hectares at the end of 1965-66. About 3 million hectares were added during 1968-69. The Fourth Plan had the benefit of irrigation over a total of 23.5 million hectares up to the end of 1974-77, 27.8 m. hectares were benefited by minor irrigation works. During the Fifth Plan, it was assumed that an additional 2.7 m. hectares would be benefited by minor schemes.

FINANCING OF IRRIGATION PROJECTS

In ancient India, construction of irrigation work was benevolently undertaken by the kings and philanthropists. In the early years of the British Rule, expenditure on these was met from Government revenues and the initial responsibility for their construction was that of the military engineers. Subsequently the P. W. D. and later on the Provincial Governments got powers over irrigation works and development. In the middle of the 19th century attempts were made to promote irrigation development through private companies with a Government guarantee of 5 per cent return upon capital invested, but this did not prove successful. By 1866, the raising of specific loans for the purpose was considered justified if the works could reasonably be expected to be remunerative. The acceptance of this principle gave a definite stimulus to the development of irrigation and for the first time funds were assured in reasonable amounts and on a regular basis.

In 1879, the Committee (set up by the British Parliament to prescribe tests of productivity and to safeguard the loan capital for the execution of irrigation projects) laid down that "simple interest on capital cost of works at the beginning of a year plus working expenses for the year should be less than the direct and indirect receipts for the year." It was, therefore, decided that the results of irrigation works should be tested by their financial returns. Schemes were sanctioned and loans raised for their execution after the Government felt satisfied that they would be able to recover through water rates, as additional dues, revenues sufficient to meet annual working expenses on maintenance and operation and to pay interest on the loans raised. Several of these schemes brought revenues to the Government which exceeded the annual working expenses and interest charges and thus yield substantial net profit.

Productive Works

Irrigation schemes works were classified by the Government as *productive* and *unproductive*.

A *productive* work was one the net revenue derived from which within ten years after the date of its completion was more than a definite percentage on the total capital outlay. This definite percentage was fixed by the Central Government from time to time :—

For works sanctioned before 1 April, 1919	4%
For works sanctioned between 1 April, 1919 and August 1, 1921	5%
For works sanctioned between August 1, 1921 till March 31, 1937	6%
For works sanctioned after April 1, 1937	Different percentages were fixed by the Provinces, ranging from 4 to 6%
From April 1, 1949 to March, 1954	3.75%
From April 1, 1954 to February, 1960	4.5%
From March, 1960	5%

Unproductive Works

Unproductive works were those which yield a net revenue less than the percentage fixed for productivity.

After 1921, all “productive” works were financed by Provincial Governments either from the general revenues or more often from loans raised on Government security. “Unproductive”, and “minor” works were financed always from general revenues of the Provinces concerned or by grants from Central Government from general revenues. “Minor” works were small works for which detailed capital and revenue accounts were not maintained, and they may be productive or unproductive.

Protective Works

After the great famine of 1877-78, “protective” works came to be recognised. These works were designed primarily for the protection of precarious cultivation, the direct result becoming a secondary consideration. After 1901, many new protective works were taken up for construction. Nevertheless due to paucity of funds the emphasis remained on the ‘remunerative’ or ‘productivity’ of irrigation projects rather than the security they could afford to insecure and precarious areas. This system continued to be followed till about 1950, when it was felt that even though the projects did not fully satisfy the productivity test, but were otherwise useful, should also be developed. So that now the financial criterion according to which the utility of irrigation projects used to be determined has yielded place to the concept of benefit-cost ratio.

Cost-Benefit Ratio

The value of a scheme is judged by the overall benefits it confers on the community as compared to its annual costs. The primary benefit accruing from an irrigation project is the net addition value of the increased production after irrigation. This is the difference between the values of the farm produce after meeting cultivation expenses after and before irrigation. The amount arrived at in this manner is compared with the annual costs consisting of the interest assumed at the rate of 10 per cent on capital outlay, depreciation and administrative expenses. It has been felt that a project should be considered worth while if the benefit-cost ratio is not less than 1.5 : 1, though special consideration is given to exceptional cases such as those of scarcity and backward areas.

Pattern of Assistance

The financial assistance from the Centre to the State is normally in the form of loans for a specified carrying interest at 5.75% per annum, from the date of commencement of such loans. These loans and interest thereon, are payable in equal instalments—generally 5 to 10 years after the commencement of the project, interest charges, however, being payable annually.

For major irrigation works, the total financial assistance sanctioned by the Central Government consists partly of loans and partly of grants. A subsidy ranging from 25 to 50 per cent is granted to private and co-operative ventures by the Central and State Governments. Subsidies for tube wells and lift irrigation and grants for the purchase of diesel engines are also given by the Centre.

Irrigation Revenue

Revenues realised from irrigation projects are classified as 'direct' and 'indirect.' *Direct revenue* to the Government from irrigation works consists of the charge for the supply of water. This varies with type of crops cultivated and is levied on the basis of area irrigated.

Indirect revenue consists of a share of enhanced land revenue less increased cost of civil administration ; interest on sale proceeds of Government waste lands developed from the project; rent or lease money for temporary cultivation of Government waste lands irrigated from a project before they are sold ; and receipts from canal plantations, pisciculture and provision of recreational facilities.

While irrigation projects are financed from public funds, benefits accrue to individuals by way of improved productivity from land and appreciation in its value. It is, therefore, considered equitable that the Government should take a part of this unearned gain. This charge is termed as *betterment levy*, and represents the share of the

Government in the increase in value of land accruing as a result of the provision of irrigation facilities. This is to be assessed on the basis of appreciation of land values or the increased productivity from land on account of provision of irrigation. It is levied only once when irrigation is first introduced and is usually recovered in a number of equal annual instalments. The amount so recovered is considered as a reduction in the capital cost for working out financial return.

Recent Trends

The committee of Ministers of States in charge of irrigation (1964), held that irrigation not only helped the farmers, but also yielded many other benefits, both direct and indirect, and that a project should be considered acceptable if the direct benefits bear a certain ratio by servicing costs, *i.e.*, even if the operating costs are not fully covered by the water rate collections.

The Irrigation Commission (1972) has held that irrigation works should give an annual income which is at least equal to the annual cost of operation, and that no part of the burden for providing irrigation should fall on the general tax payer because the irrigated agriculture gives considerable profit to the farmer and that process of development needed mobilization of resources from the farm sector also. Further, the Commission based its above recommendation on the fact that government had incurred huge net loss in this sector : irrigation works in India were making a net annual contribution to the exchequer of over Rs. 1 00 crores in the late forties, while 20 years later they were incurring an annual loss of Rs. 57 crores.

The Commission has further recommended that projects should be accepted only if benefit cost ratio is more than 1.5 *i.e.*, benefit exceeds cost by 50 per cent. In drought areas, it recommended this ratio to be fixed at 1, *i.e.*, the benefits equalling cost. In working out the above ratio, the Commission suggested that investment on anicut development comprising land levelling, construction of field channels and drains should be taken into account, while excluding soil conservation measures in the catchment area.

WATER RATES

When water is supplied for actual irrigation in the field, charges are levied for the water so supplied which comes under the category of water rates. The main source of return on investment in irrigation projects lies in realisation of water rates from the beneficiaries.

Water rates may be charged in one of the following ways :

- (i) *Volume system*, under which irrigation is levied on the actual quantity of water used. Such system is suitable

where water is dear or scarce and the area of operation smaller as under tube-well or lift irrigation with pumps.

- (ii) *Uniform rate System*, under it the water rate is charged uniformly i.e. on the basis of area irrigated. No differentiation is made on the basis of the crops.
- (iii) *Differential rate system*, under it the rates differ cropwise per hectare.
- (iv) *Lease system*, wherein the rates are fixed by mutual agreement between the irrigation department and farmers, the period of lease being dependent on the period for which the supply of water is assured.

The most common basis adopted by the Irrigation Department for fixing rates is to charge according to crops grown per hectare.

The basis and procedure for assessment and realisation of water rates vary from state to state and in many states, it is different for different categories of works. In states like U.P., Punjab, Haryana and Rajasthan, the water rates are charged for actual area irrigated under different crops, the rates varying with the crops. While in states like West Bengal, Bihar, Maharashtra, Gujarat and Kerala the assessment is on the areas and crops entered into agreements for irrigation irrespective of the fact whether the areas concerned are actually irrigated or not. In West Bengal and Orissa, a uniform rate is realised year after year for the entire command of an irrigation work and no field-wise or crop-wise irrigation is recorded. In Andhra Pradesh and Tamil Nadu, the land is classified as dry and wet. Assessment is crop-wise, but subject to certain minimum for the entire command even for fields which are actually not getting any benefits for irrigation. Water rates are not being realised in Assam and Himachal Pradesh. In certain tube-well irrigated areas water rate is charged on the basis of actual volume of water supplied or on the basis of electrical energy consumed. This system is prevalent only over a very small fraction of the total irrigated area.

In the new irrigation undertakings, the basis for fixing rates varies. For example, in the Tungbhadra project, water levies are computed on the basis of net return per hectare and the volume of water supply necessary to bring the crop to maturity. Net income is arrived at on generalization. In Hirakud project, water rates are based on increases in the gross income per hectare. In Bhakra Nangal, water rates are based on the existing occupiers rates. The D.V.C. fixes rates arbitrarily due to lack of data on the cost of cultivation and output.

Irrigation works have, nevertheless been constructed to guard against possible failure of rains and so the most acceptable method of charging seems to be to make an initially lower charge, which makes

water available to the cultivator when he wants it during terms of years for which the charge is fixed. From the view-point of the cultivator this is also economical as he need not wait till the last moment for the water he may need. And from the point of view of the Government also, it is fair as a certain minimum charge is assured to ease the burden of interest and maintenance charges.

The Committee of Ministers of States in charge of irrigation (1964) made certain important recommendations in regard to water charges, such as : (i) The water rates should be raised which may be fixed at 25 per cent to 40 per cent of the additional net benefits to the farmer arising from irrigation keeping in view factors like rainfall, water requirements, yield and value of crops : (ii) Where it is not feasible to work out the additional net benefit water rates may be fixed, to start with, as a suitable percentage of the gross income of the farmer from irrigated crop ; the percentage to be so fixed may be from 5 to 12. (iii) There should be a basic charge to cover at least the operation and maintenance costs, whether the irrigation is actually used or not. This charge should form part of the water rates, where water is used for irrigation.

In the context of development planning with a preponderant accent on food production, water rates should not be laid down as the basis of investment made on irrigation projects. An incentive to ensure increased production can be given by not imposing high water rates, and provision of free water in areas of low productivity. It has also been suggested that Regional water Rates Boards should be appointed to fix irrigation rates according to the productive capacity of the area, and to act as tribunals to settle disputes regarding irrigation rates.

The Irrigation Commission has dealt with the question of water rates for conjunctive use of surface and ground water. It has laid down the following principles for fixation of water rates :

- (i) The water rates should be related to the benefit which irrigation confers, rather than the cost of an irrigation project.
- (ii) In particular, water rates should be levied on crop basis except in the case of irrigation from tube-wells.
- (iii) The rates should be between 5 to 12 per cent of the gross income from the crop, the upper limit being applicable to high value crops.
- (iv) The rates should also be within the paying capacity of the irrigators, and should aim at ensuring full utilisation of available supplies.

The Commission has suggested normal irrigation rates where canal supplies are augmented by state tubewells, or where a cultivator supplies supplemental water from his own well or tubewell to canal irrigated fields thereby deriving additional benefit. The Commission has also suggested that if in the canal commanded area a cultivator irrigates exclusively from his own ground water source, where canal water is not available or is available inadequately, he should not be charged any water rate. It also suggested that the command area should be divided into three categories on the basis of quantity and timeliness of supplies of water. Lower rates may be fixed, where on account of good rainfall the demand for irrigation water is less or where the supply is inadequate and uncertain. It has further recommended that the laws regarding betterment levy should be amended to ensure that half the capital cost of the irrigation projects is recovered from the beneficiaries.

The National Commission on Agriculture endorses these recommendations. It also agrees with the recommendation of the Ministers' Committee to Suggest Ways and Means of Improving Financial Returns from Irrigation Projects (1964) that "in states where irrigation charges are optional, in consideration of the irrigation facilities having been made available for an area, there should be a charge to cover at least the maintenance and operation charges, whether the facility is actually made use of or not". The N.C.A has recommended that "states should review the restriction imposed on exploiting ground water in the canal commanded areas with a view to relax them to the extent feasible in the interest of the larger conjunctive use of surface and ground water and increasing the scope of irrigation.

MODERNISING IRRIGATION

The National Commission on Agriculture has assessed the irrigation Potential from all sources, at about 93 million hectares which is only about half the total crop area ...With full harnessing of the water resource only about one-fourth of the cropped area would be irrigated. Hence, maximum benefits need be derived from the irrigational schemes. The Irrigation Commission has also felt the need for improving the irrigation system in order to increase their efficiency and usefulness. It has pointed out that "in the run-off of the river schemes, which derive their supply of water solely from diversion works on rivers, shortages are experienced during the low stage of river flows which occur in summer in the peninsular rivers and in winter in the plain area rivers. The earlier irrigation systems of North India were designed with low intensities and cultivators given a share of water proportionate to their holding in the commanded areas. They have naturally been applying water thinly to irrigate as much area as possible. Thus, mode of irrigation is not conducive to high yields particularly from high yielding varieties.

On many irrigation systems, the channel capacities are inadequate for meeting peak demands during crucial periods like transplanting of rice, and irrigation of rabi crops. The tail reaches of canals suffer most from these inadequacies. Therefore, it is necessary that the existing efficiency of the irrigation schemes should be greatly improved.

The National Commission on Agriculture has suggested this by: (a) remodelling the head works or augmenting channel capacity, or by amending the cropping pattern; (b) reducing transit losses; (c) planning drainage schemes; and (d) the efficient utilization of irrigation through integrated development of the Command Areas.

(a) **Augmenting Channel Capacity.** The Commission has emphasised upon augmenting irrigation supplies through conjunctive use of surface and ground water. It can take the form of supplementing canal supplies with water from state owned tube-wells or use of water from private tubewells and filter points in the anicut for irrigating the same or additional area during periods of low canal supplies or canal closures. State tube wells can be sunk to irrigate high patches of land in the canal command area. Also in irrigation systems which run for one crop season only, ground water could be used for a second or third crop. In many states, there are restrictions on sinking tubewells or wells within a prescribed distance of irrigation channels on the ground that this may lead to larger lossess of water due to percolation in unlined channels. Hence, the State Governments should review these restrictions particularly if the soils are of clay type with minimal percolation losses in the canals or if the canals are lined. Ground water pumping is also absolutely essential in order to combat waterlogging by lowering the water table.

The adoption of proper cropping pattern is also of utmost importance which should suit the irrigation schedule. Storage schemes offer greater flexibility in regulating supplies as releases can be made to suit the requirements.

(b) **Reducing Transit Losses.** Available irrigation supplies can be increased by reducing transit losses. This can be done by lining canals. It was estimated in 1960 that the unlined canals in India carried a discharge of about 11,300 causes and that lining could save enough water to irrigate an additional 6 million hectares. Canal seepage losses can be removed by pumping ground water. But experiments have shown that the lining of channels has been more efficient and a cheap method as against pumping *e.g.*, in the Krishna and Godavari deltas, the capital cost worked out to about Rs. 620 per hectare as against Rs. 500 for lining channels. However the lining of field channels which serve an area of less than 6 hectares or which run far less than 400 hours in a year, would not be economic. According to the Commission better water management can also be achieved through use of concrete pipes for distribution of water to

the fields as is being done in states like Gujarat, Haryana and Tamil Nadu. Lining water courses has also a good employment potential spread over a large rural area. A hectare of irrigated land normally requires about 75 meters of water-course. If half of the irrigated area of 20 million hectares at present served by major and medium irrigation projects is to have lined water courses, about 750 thousand Kms. would have to be lined. This would cost about Rs. 600 to 700 crores and provide employment of more than a million man-years.¹

(c) **Planning Drainage Schemes.** Drainage should be provided alongside the development of irrigation systems so that water percolating from irrigation channels and irrigated fields could raise the ground water table and lessen the waterlogging problem. The drainage system should extend to field drains, which may be needed not only for crops requiring light irrigation but for rice fields. The nullahs lower dam have also to be kept clear of all obstructions so that the drainage systems can function efficiently. The responsibility for construction and maintenance of field drains should correspond to that for water courses and field channels i. e., the responsibility of the project authority should end at 40 hectare blocks below which the construction and maintenance of channels and drains should devolve on cultivators.² The farmers should be provided with proper guidance in the matter of alignment and design by the extension staff.

Further the area under irrigation can be maximised by controlling and regulating water flows. This would need that irrigation canals must be equipped with such regulation structures as can control the quantity of water-flow at some important points of the channel. Adequate diversion structures can be made which can divert water flow and control its quantity to suit cropping programmes. The order of water distribution (i. e., *warabandis* or *osrabandis*) should be firmly laid down by the state departments of agriculture as has been done in Punjab, Haryana and U. P. the system of water supply should be simple and should involve a minimum of procedural steps. Canal officers should be entrusted with sufficient powers so that offenders wasting water can be prosecuted.

The National Commission on Agriculture after making study of some important irrigation schemes such as the lower Bhawani Project (Tamil Nadu), the Badua Project (Bihar), Shetrunji Project (Gujarat), Ghod Project (Maharashtra) and the Harsi Project (M. P. has reached the decision that considerable scope lies for improvement in the following directions:³

(a) Augmentation of supplies from other sources, surface or underground ;

1. National Commission on Agriculture, *op. cit.*, p. 9.

2. *Ibid.*, p. 14.

3. *Ibid.*, p. 38.

(b) Improvement of engineering structures like remodelling of headworks, enlargement of channel capacities, lining, provision of more regulatory structures, extension of drainage system and improvement of outlets in respect of their structure and capacity.

(c) Ayacut developments or improvement comprising land levelling and shaping ; realignment of water courses and field channels and their lining, where necessary : field drains ; ayacut roads and storage facilities ; consolidation of holdings ;

(d) Making change in the cropping pattern ;

(e) Operating of channels to better conform irrigation supplies to water requirement of crops.

The importance of timely supply of irrigation water cannot be over-emphasised. If the sowing of wheat is delayed beyond three weeks, of its proper sowing time, a drop in the yield of 3 quintals per hectare is likely to occur for each week's delay. Like-wise, if transplantation of rice is delayed by a month a heavy drop in the yield of even upto 50 per cent may take place. Yields get considerably reduced if water is not supplied during the crucial stages of plant growth, such as emergence, seedling, tillering, pre-flowering, flowering and grain formation. The scheduling of irrigation supplies should aim at meeting these requirements. If these cannot be met in full, the running of channels should conform to the more crucial stages of growth of the predominant crop. The irrigation engineer should consult agricultural officers for making the most productive use of water supply.

The various steps which have been considered necessary for prompt utilisation of irrigation potential created and its efficient use of field, encompass the activities of a number of individual Government department like Irrigation, Agriculture, Revenue and Cooperation and no single department would be in a position to provide all the requisite arrangements. It is only by a close inter-disciplinary and inter-departmental approach that the measures required for prompt and efficient use of irrigation facilities can be ensured. Such an approach, known as command area approach, was introduced in 1964-65 in some major irrigation projects, by constituting special administrative agencies for this pupose.

(d) **Command Area Development Programme.** This Programme seeks to accelerate the process of utilisation of irrigation potential and improves the efficiency of utilisation through a multi-disciplinary approach. The ultimate objectives are : (i) securing of maximum yields per unit of water or per unit of land as the case may be, depending on the availability of water, soil and climatological factor in a basin ; (ii) enabling the farmer not only to secure maximum production, but also to get the maximum economic benefit by proper and

timely disposal of his produce through adequate facilities like communications, markets and processing industries.

An integrated CAD programme was initiated towards the end of the Fourth Five Year Plan with a will to making maximum use of the available irrigation water. The programme was being continued under the Fifth Plan and 60 irrigation projects with ultimate irrigation potential of 13.2 m. hectares have been identified for the integrated development of command areas. Broadly, the programme covers on-farm development works comprising field channels, field drains, land levelling and land shaping operations. The programme also envisages strengthening of the existing training and administrative organisations, ground water development in the command areas, adoption of suitable cropping pattern, proper regulation of canal system of irrigation, provision of adequate main and intermediary drainage, modernisation of existing irrigation systems.

A Command Area Development Authority to discharge the above functions has been envisaged for each command area. At present, 37 CAD Authorities covering 47 irrigation commands in 102 districts in 12 States are functioning. On-farm development works under some of these authorities have made fairly good progress. Planning and design has been done on 14.26 lakh hectares, field channels constructed in 95.205 kms., field drains constructed over 17,634 kms. and land levelled in 7.80 lakh hectares by December, 1977. Surveys have also been undertaken to assess the quantum of ground-water available in command areas in M.P. and Bihar. Financial assistance from IDA/IBRD for the CAD programme has been attained in some selected commands, particularly for Chambal and Rajasthan Canal in Rajasthan and M.P. Agreements for a composite CAD project has been signed for Nagarjunsagar and Pachampad Command Area in A.P. ; for Gayakwadi—Purna in Maharashtra ; Perujar—Vaigai project in Tamil Nadu and Tawa project in M.P.¹

The strategy for the Five Year Plan, 1978-83 centres around the fact that there has not been commensurate infrastructure facilities in these CAD areas. Therefore it needs that : (i) irrigation system should be properly modernised (ii) drainage is given a high priority ; (iii) priority is given for full package of on-farm development works in 3 m. hectares and construction of field channels and related structure is made on 8 m. hectares ; (iv) pace of consolidation and realignment of field boundaries and up dating of land record has to be accelerated ; (v) essential roads are constructed on a priority basis ; and (vi) ancillary activities, like development of marketing and processing facilities, animal husbandry, farm forestry should be

1. *Report of the Department of Agriculture*, Ministry of Agriculture for 1977-78, pp. 49-50.

organised by the CAD Authority for integrated development of the areas.¹

Causes of Inadequate Utilization of Irrigation Potential

The gross non-utilization and under-utilization of water has been due to a number of causes, such as :

(a) delay in the construction of link canals and field channels, which has prevented the peasants to take water to their fields as soon as it became available.

(b) There is no certainty about the utilization of the irrigation potential by the farmers. Whenever there is a good rainfall, cultivators hardly use any irrigation water. But in years of scanty rainfall, all the cultivators rush to utilize irrigation water causing further scarcity. This leads to uneven distribution of water in field adversely affecting the productivity of crops. This system has three main disadvantages : (i) loss to the State revenues in the years of non-utilization of irrigation water; (ii) adverse effects on agricultural productivity and (iii) financial loss to peasantry as they have to pay 3 to 4 times more than the normal irrigation rates in years of scanty rains.

(c) Unwillingness of the farmers to share financial burden of irrigation facilities such as water cess and improvement taxes.

(d) A lag in agricultural efforts either because of the inadequacy of investigational data or hurried planning of the projects or through persistent political or socio-economic influences.

(e) Higher rent of the irrigated land—often 50 to 60 per cent of the gross produce or even more—virtually takes away the incentive effect from the producer in deriving the benefit of higher productivity.

(f) In surface irrigation, using distribution system consisting of main canals, branch canals, field channels, etc., it has been estimated that 40 to 45 per cent of the water entering the distributing system is being lost into earth by percolation before reaching the field : and half of the water given to the fields is lost before it gets to the roots of the plant.² An assessment on the Ganga Canal indicates that losses occur upto 15 per cent in the main canal, 7 per cent in the distributories and 22 per cent in village water courses.³

(g) In some areas the farmers are used only to rain-fed crops with the result that newly created irrigation potential is not being fully utilised.

(h) Medium and minor irrigation projects have not been able to show the desired results due to the inadequacy of steel and cement

1. *Draft Five Year Plan, 1978-83*, 1978 p. 140

2. Ministry of Co-operative and Community Development, *Better Use of Land*.

3. *Bhagirath*, Vol. XI, No. 1, 1964, p. 24.

and many of the tube wells have been reported to be working below capacity or not working properly, due to want of electricity or fuel-oil for working the pumps.

(i) Lack of advance planning in the distribution of improved seeds, fertilizers, and other inputs.

(j) Lack of coordination between States' Irrigation, Agriculture Planning and Development Department, due to which the farmers, who are willing to utilise irrigation water, do not receive takavi loans for the purchase of pumps, oil engines, rahats, lifts, and other accessories and financing for preparing land for irrigation well in time.

(k) Lack of coordination between major and minor irrigation works ; inadequate attention to drainage needs, inadequate attention to irrigation research on water requirements of crop on different soils, and the silting down of canals due to floods are other reasons.

Measures for Effectively Increasing Irrigation Potentials

1. It is necessary to see that our water supplies are put to utmost efficient use. Water management is regarded as a "must" in agricultural technology. Water management has to be accompanied by suitable systems of soil surveys, crop patterns and crop rotation, use of high yielding seeds, application of adequate and appropriate quantities of chemical fertilisers and pesticides and adoption of improved and scientific agricultural practices. Besides, land preparation, levelling and grading of land and designing proper layout for irrigated farming are extremely important for optimum use of available water supply.

2. At least during the first 2 or 3 years the irrigation rates should be attractive, even subsidised, if necessary, so that the farmer gets used to the benefits of irrigation. Also water charges should be fixed at a uniform rate for each crop irrespective of the fact whether water is supplied through major irrigation canals, tube-wells or minor irrigation projects.

3. Effective demonstrations must be given to convince the cultivators of the proper use of water for different areas and crops. He should also be made conversant with simple methods of determining moisture content, root zone and the actual depth of water percolation on the fields at the time of irrigation.

4. Forming of *Osrabundi* (schedule of turns) and responsibility for enforcing it should progressively be transferred to beneficiaries either through co-operatives of beneficiaries, panchayats or panchayat.

5. In order to ensure that as far as possible, the irrigation water reaches the cultivator's fields about the same time it becomes available at the head works, there should be synchronisation in the

programmes for the construction of head-works, canals, distributaries water courses and field channels.

6. Development blocks should be set up over the entire area to be served by an irrigation project so that full advantage could be taken of the irrigational facilities.

7. In order to eliminate delay in the excavation of water courses and channels, their alignment should be marked out by the project authorities on village maps and these maps should be supplied to the district and block authorities for getting the field channels excavated by the beneficiaries in time.

8. What is required urgently is organisational integration of all types of irrigation works under one technical control for single control will lead to a better utilisation of irrigation than what has been possible so far. Streamlining of irrigational management is urgently called for.

9. Administratively, irrigation works can be classified more rationally under two categories : local and trunk. Where long distance transmission of water is involved, the works should be included under the trunk category, whereas where water is made available from local resources, they should be reckoned as local. A unitary control on both types of works could lead to proper dovetailing of irrigation facilities provided under different types of irrigation works.

10. Large tracts of land are subject to over-flooding and in the absence of proper drainage, are likely to go out of cultivation. Water logging and over-flooding can be prevented through a provision of adequate water and field channels.

11. More systematic attention must be paid to the stepping up of the efficiency of minor irrigation works by the installation and energisation of pump sets. Besides, not only the number of minor irrigation works should be increased but the existing ones need also be kept in a proper state of maintenance and those needing repair like silted tanks, and irrigation channels, wells with lower water tables, brought into a state of efficiency.

12. Transit losses can be reduced by improving the conveyance methods. Application losses can be reduced by educating the farmer properly on the proper methods of lay-out of land, proper control of distribution of water. Evaporation losses can be reduced by adopting proper devices.

13. The surplus surface monsoon flows can be utilised by diverting them to recharge ground water supplies so that water can be available for winter crop. The possibility of using the recharging device should also be considered for desert areas of Rajasthan, drought prone areas of North Gujarat, parts of M.P., Maharashtra, Karnataka

and Andhra Pradesh (particularly the Bijapur and Dharwar districts and the Rayalaseema areas).

FUTURE PROSPECTS

As noted earlier, the water potential is an enormous volume. In spite of a vast irrigational development, greater possibilities still exist for further expansion. Greatest opportunities for developing irrigation lie along large rivers in the arid regions which are fortunate in enjoying a warmer climate, good facilities for drainage and rich soils. These three conditions make them very suitable for diversified farming and high priced agriculture provided irrigation facilities are developed here. As rivers often dry up during summer season, a constant flow of water can be maintained only if storage reservoirs are made across the rivers from which canals may be dug. Though irrigation of these areas will be a costly affair, yet the construction of reservoirs would prove economically useful inasmuch as possibilities of superior agriculture will be much developed.

Besides, in areas where flow irrigation is not possible either due to unfavourable topography or due to insufficient water supply, but where ample underground water exists, reliance should be put on its maximum exploitation by making tube wells as in western Rajasthan, Gujarat, parts of Andhra Pradesh and South-west Punjab where water table is not below 50 ft.

Irrigated agriculture is not merely application of water to the fields on a random basis, but the questions when to take water, how much water to be applied, methods of water application, also have a great bearing on the efficiency of irrigation. Irrigation has to be operated on considerations like soil, moisture and plant growth relationship, determination of optimum moisture, duration of different crops, interval between successive irrigation in soils of high, medium and low moisture capacities, and inter-relationship between the above factors. The quantity of water to be supplied is also governed by factors like rate of consumption and evaporation at different stages of crop growth and soil moisture deficits, to fix the amount of water to be applied.

In the application of irrigation, uniformity of depth adds considerably to efficiency. Proper drainage, check on soil erosion and easy workability of agricultural operations are also important factors needing attention. Besides, an irrigator has to take into account many other like slope of land, texture and intake rate of soil discharge to be handled, length of run and depth of strips and in case of border strips, length of furrows and distance between furrows, and size of plots in relation to discharge of water. *Infact irrigation is not only a science, but also an art in itself.*

While agricultural land forms the body, water is a vital fluid that sustains our agrarian economy. Timely supply of this vital fluid is getting precious day by day. The rule of thumb practices had to yield place to precise and rational criteria to ensure that we develop a planned economy with regard to the utilization of water for irrigational purposes. Water from the Ganga, Ken and Sone rivers could be explored to store it in reservoirs in south Bihar and south-eastern U.P. Natural depressions such as the Phalgu river could be utilised for storing this water in south Bihar ; while the waters of Ganga and Sone can be pumped 250 to 300 metres for storing it in the drought-prone areas of Varanasi, Banda and Mirzapur, as a result of which about 4 lakh hectares could be brought under irrigation.

Our ultimate objective should be to reduce the extent of rain-fed and unutilised lands by regular supplies of water. Scarcity areas in the Ganga basin itself (such as Mirzapur, Rewa plateau, Palamau and Gaya belt) must be developed to become granaries as the Krishna and Godavari deltas have been converted into rice bowls. Next in importance are the irrigation projects for Gujarat and M.P., and in particular the exploitation of the Narmada. Water conservation projects like Krishna, Tehri and Rajghat dams must be built quickly. Storages on Sarda, Ghagra and Rapti are necessary to save eastern U. P. from floods and also for conserving water.

National Water Grid

India has large resources of water, of almost the same magnitude as in the U. S. A. which is two and a half times large in area. Our water resources are, however, not uniformly distributed. Basins of rivers like the Ganga (below Patna), Brahmaputra, Mahanadi and west flowing rivers in coastal western India have flows in the monsoons which are in large surplus of any foreseeable needs of the basins, while the rest of the country has relatively meagre and highly variable water flows.

A National Water Grid has been conceived to interlink the various rivers to achieve the following objectives :

- (1) Surplus waters of the various rivers should be utilised beneficially by transfer to water deficit zones.
- (2) Even in water deficit areas, one river or the other is in flood every year, which flows waste to the sea. The rivers must be interlinked to make use of such surplus waters when available. This will even out the variations from year to year in the water supply for agriculture.
- (3) Surplus waters must be used on priority basis in chronically drought affected areas. With the climatic conditions in India, and the large population dependent on agriculture, additional food production and additional employment opportunities to the largest

segment of population can accrue only if water for irrigation is made available in arid and semi-arid areas of India which cover two-thirds of the country.

(4) There is no communication by water between the northern and the southern part of the country in the absence of a river flowing from north to south. A National Water Grid will provide such a water link.

(5) Navigation provides the cheapest mode of transport for bulk materials. Extensive exploitation of coal for power generation and other uses requires its transport by the cheapest way and it is best done by a National Water Grid.

(6) The interior parts of Central India are at present isolated and inaccessible. These areas which are rich in coal, minerals and other natural resources have to be opened up for economic development. This can best be done by a National Water Grid.

(7) Drinking water is scarce in most parts of Central Plateau of India. A National Water Grid can provide an excellent source of water in these areas.

Some of the components of the Grid which can at present be visualised are :

(i) Ganga-Cauvery link, connecting the Ganga in the north with Cauvery in the South and passing enroute through the basins of Sone, Narmada, Tapi, Godavari, Krishna and Pennar.

(ii) Brahmaputra-Ganga link :

(iii) Link canal from the Narmada to western Rajasthan.

(iv) Canal from Chambal to pump areas to Central Rajasthan.

(v) A canal link from the Mahanadi to serve coastal areas in Orissa and Andhra Pradesh and establish link with other canal systems.

(vi) Links from west flowing rivers of Western Ghats towards the east.

The waters of the Grid are proposed to be used for irrigation in the drought affected districts, which have about a third of the country's crop area and a third of the country's population. These areas will have very little irrigation and that too with a large proportion of supply from insecure sources like small tanks and shallow wells, even after all possible local sources are exploited. Such drought affected districts lie in south Uttar Pradesh, Bihar, Gujarat, Rajasthan, Madhya Pradesh, Karnataka, Maharashtra, Andhra Pradesh and Tamil Nadu and also a few small patches in Orissa, West Bengal and Haryana.

The scheme envisages the taking off of a canal from the Ganga near Patna at an elevation of 46 metres and lifting 1,700 cu. metre/sec. of water to Sone barrage for pumping. After allowing 283 cu. metre/sec. for use in south U. P. and south Bihar, 1,415 cu. m./sec. will be lifted along the Sone river in stages. The water so lifted, after cutting across the ridge between the Sone and the Narmada basins, will be conveyed to the proposed Bargi reservoir on the Narmada river. A part of the transferred water will be released into the Narmada river for use in the drought affected area in the Narmada and the adjoining basins. The remaining water will be diverted into the Wainganga river and led into the proposed Inchampalli reservoir on the Godavari river. Some utilization en-route is also proposed. The transferred water together with surplus waters of the Godavari and Narmada will be pumped into an elevation of 305 metres from where a gravity canal will lead the waters into the Srisailem reservoir, which is under construction on the Krishna river. The water from this reservoir would be fed into Kunderu river, tributary of the Pennar river. From Pennar near Cuddapah, a gravity canal will carry water to the upper Anicut on the Cauvery river. The total length of the link would be about 2,643 km. out of which 1,064 km. would be along the canal and 1,533 km. along the river water route.

In view of the size of the scheme and the complex magnitude and the cost of the studies required therefor, it was considered advisable to consult international experts before embarking on the investigations. The U.N. Mission which examined the proposals has in its report endorsed the concept of a National Water Grid. It has stated that : "India's national economy in its development and growth will be confronted with the problem of increasing scarcity of water within the next thirty years. From basic complications of future water demands and water yields it becomes evident that by the year 2000 or so the National Water Grid will be a vital necessity. No time should be lost to start the very complex and difficult investigations today so that plans will be matured and prepared in due time and the facilities will become operative when the need will have come."

It has been pointed out that the Grid can make available additional waters to the country much cheaper than any conceivable alternatives like desalination.

The Garland Plan

Shri Dastur has prepared a plan for the construction of 3,701 km. long, 305 metre wide and 9.1 metre deep Himalayan Canal extending from Sutlej to Cherrapunji at a uniform level of 914 metre above main sea level and 8,851 km. long Southern and Central Garland Canal encircling peninsular India at a uniform level of 457 metre above mean sea level.

The two canals are proposed to be linked by 10 pipes of 3.7 metre diameter for diversion of water collected from Himalayan streams to the Garland Canal. It also provides for construction of 300 reservoirs of about 617 m. cu. metre storage each along the Himalayan Canal, 600 storage of 370,045 m. cu. metres near Nagaur in Rajasthan with the construction of 91 metre high dam over an area of 104 sq. km. and a storage of 123,348 m. cu. metre on the Sone. The scheme is estimated to cost about Rs. 14,000 crores. The scheme is under the consideration of the Government.

Future Irrigation Policy

In view of the complete inadequacy of water resources to meet the agricultural and other requirements, it becomes necessary that the available resources are conserved and utilised most judiciously and economically. The National Commission on Agriculture has, therefore, very slightly observed that "there has to be proper 'planning' for water use with river basins/sub-basins as natural units of such a plan, to provide a comprehensive outline of development possibilities of land and water resources of basins, establish priorities in respect of water uses for various purposes and indicate *inter se* priorities of projects." Accordingly, the Irrigation Policies in general should envisage :¹

- (i) maximum production per unit area through multicropping in areas with ample water resources ;
- (ii) maximum production per unit of water in regions of medium and low rainfall, in which a large part of the country lies ;
- (iii) provision of maximum protection in drought areas ;
- (iv) maximum utilisation of irrigation supplies from storage during the eight months of the year excluding summer months when evaporation losses are highest ; and
- (v) conjunctive use of surface water and underground water.

1. *Abridged Report of the National Commission on Agriculture*, p. 190.

APPENDIX 1

Ground Water Resources—Statewise

State	Amount of contribution of rain fall to ground water recharge	Possible recharge due to canal infiltration	Total	Evapo-transpiration and sub-surface-run off losses	Net ground water recharged	Annual draft by the end of 1967-68	Net ground water charge available for further ground water development	Area irrigated by ground water at present (million acres)
Andhra Pradesh	20.0	4.6	24.6	30	17.2	3.57	13.6	1.4
Assam region including Nagaland, NEFA etc.)	40.7	1.2	41.9	60	16.7	0.003	16.7	—
Bihar	26.9	4.4	31.3	30	21.9	2.35	19.5	1.2
Delhi	0.5	—	0.5	30	0.3	N.A.	—	—
Gujarat	14.1	0.4	14.5	30	10.2	4.3	6.1	1.75
Haryana	3.0	1.6	4.6	25	3.5	0.75	2.7	0.75
Himachal Pradesh	2.3	—	2.3	60	0.9	N.A.	—	0.003
Jammu and Kashmir	9.6	0.4	10.0	60	4.0	0.001	4.3	0.03
Kerala	9.5	1.2	10.7	50	5.4	0.004	5.4	0.016
Madhya Pradesh	43.1	1.4	44.5	40	26.7	4.22	22.5	1.00
Madras and Pondicherry	12.9	3.5	16.4	30	11.5	3.47	8.00	2.30
Maharashtra	19.8	1.2	21.0	40	12.6	3.41	9.2	2.00
Mysore	14.8	1.8	16.6	40	10.0	0.03	9.0	0.75
Punjab	5.1	4.0	9.1	25	6.9	3.3	3.6	3.5
Orissa	19.4	3.4	22.8	30	16.0	0.15	15.8	0.20
Rajasthan	4.0	1.8	5.8	40	3.4	2.7	1.4	3.00
Uttar Pradesh	34.5	10.0	44.5	20	35.4	17.92	17.6	9.00
West Bengal	19.6	3.4	23.0	30	16.1	0.36	15.7	0.10
Total	299.8	44.3	344.1		218.8	46.76	17.08	27.00

NOTES : All Units in million acre feet unless otherwise stated

APPENDIX 2

Net Area irrigated by Sources, 1973-74 Statewise (Thousand Hectares)

State	Canal	Tanks	Wells	Tube-wells	Other Sources	Total
Andhrd Pradesh	1,492	1,027	533	112	117	3,281
Bihar	898	82	157	560	623	2,320
Gujarat	193	36	966	127	19	1,341
Haryana	1,012	(a)	95	624	5	1,736
Karnataka	453	366	273	1	108	1,201
Kerala	232	76	5	—	144	457
M.P.	713	119	657	19	137	1,645
Maharashtra	299	222	840	—	111	1,472
Orissa	558	185	109	26	—	878
Punjab	1,289	—	262	1,418	7	2,976
Rajasthan	844	233	1,222	41	38	2,378
Tamil Nadu	924	929	905	26	32	2,816
U.P.	2,439	322	1,599	2,590	291	7,241
W. Bengal	960	303	17	—	209	1,489
Total India 1973-74	12,988	3,908	7,655	5,585	2,355	30,491
1972-73	13,055	3,621	7,653	5,371	2,249	31,949

(a) Less than 500 hectares.

Indian Agriculture in Brief, 1977, pp. 48-49).

APPENDIX 3

Area Irrigated by Crops, 1973-74 Statement (000 hectares)

State	Rice	Wheat	Sugar-cane	Cotton	Fruits & Vegetables	Gross Area Irrigated
Andhra Pradesh	3,205	12	175	23	15	4,154
Bihar	1,674	788	38	(a)	126	2,797
Gujarat	130	318	46	444	66	1,521
Haryana	258	1,016	133	248	35	2,584
Karnataka	722	35	112	55	55	1,422
M.P.	601	675	64	13	69	1,733
Maharashtra	340	336	215	57	178	1,764
Orissa	1,041	40	N A.	—	51	1,188
Punjab	464	2,058	96	512	66	4,619
Rajasthan	42	1,108	38	208	33	2,679
Tamil Nadu	2,485	(a)	186	109	121	3,674
U.P.	784	4,191	1,028	90	176	8,492
West Bengal	1,353	32	11	—	—	1,541
Total India 1973-74	14,676	10,747	2,152	1,337	1,022	40,221
1972-73	14,455	10,751	1,872	1,632	994	39,087

(a) Less than 500 hectares.

Indian Agriculture in Brief, 1977, pp. 50-51).

9.

Water Power & Rural Electrification

Water Power Potential

It is interesting to note that four-fifths of India's water resources come from the systems flowing into the Bay of Bengal, while the water-less regions of Rajasthan provide with nothing at all. Flowing water is an inexhaustible source of energy.

The country has substantial hydro-electric power resources. During the British period Mr. J. M. Myres had made a guess estimate of a minimum potential of 3.5 million Kw. and a maximum of 8 million Kw. But this was rather an incomplete and underestimate. The economically exploitable hydro-power potential of the country has been assessed by the Central Water and Power Commission (during the period 1953—1958) at 41.5 million Kw. at 60 per cent load factor, corresponding to about 25 million Kw. continuous equivalent to an energy potential of 216,310 million KWH, as would be clear from the table given below :

Power Potential of Indian Rivers

River System	Water Power Potential at 60% Load factor	Firm energy output annually
1. East flowing rivers of S. India	8.626 m. kw.	45,300 m. kw.
2. West flowing rivers of S. India	4.345 „	22,800 „
3. Rivers of Central India	4.287 „	22,500 „
4. Ganga Basin	4.828 „	25,400 „
5. Brahmaputra Basin	21.486 „	65,600 „
6. Indus Basin	6.582 „	34,500 „
Total for the country	41.155 m. kw.	216,000 m. kw.

The hydro-electric schemes in operation enable institution of potential of about 4 million kw., which constitutes 15.8 per cent of the assessed potential. The utilisation of hydro-electric potential

at the end of Fifth Plan is anticipated at 19.76 per cent and is expected to increase to 28.44 per cent by 1978-83. The region-wise distribution of the hydro-electric potential as assessed by the CWC and potential already developed and under development are indicated below :¹

Region	Total potential at 60 % L. F. (MW)	Potential developed at 60% L. F. estimated (MW)	% of potential	Potential under development at 60% L. F. estimated (MW)	% of potential	Potential developed under development at 60% L. F. estimated (MW)	% of total potential
1. Northern	10,731.5	1,088.3	18.5	3,002.2	18.7	3,990.5	37.2
2. Western	7,168.9	1,130.9	15.8	79.0	1.1	1,290.5	16.6
3. Southern	8,097.0	3,266.0	40.3	2,013.6	24.9	5,279.6	65.2
4. Eastern	3,633.7	570.3	15.7	516.2	14.2	1,086.5	29.9
5. North-Eastern	12,464.4	45.0	0.36	197.0	1.5	242.0	1.9
All-India	42,095.5	7,000.5	16.6	4,808.0	11.4	11,805.5	28.0

Growth of Hydro Power In India

The first hydro-electric plant in India was installed at Darjeeling in 1897-98. Soon after, in 1899, the first 1,000 kw, steam-driven power plant was installed at Calcutta. This was followed by a hydro-electric station on the river Cauvery at Sivasundram in 1903. Power was carried with 92 miles of transmission lines to Kolar gold fields. The First War gave a tremendous impetus to the use of electricity. It was the enterprising spirit of the Tatas that the biggest hydro-electric power group came into being near Bombay. Soon after this the State Governments of Madras, Punjab, Travancore Cochin and U. P. started their own hydro-electric installations.

The progress of power production was very slow till the mid-twenties, the aggregate installed capacity in 1925 amounting to 1,62,341 kw. By 1945, it had increased more than five-fold to 900,402 kw. At the beginning of the Plan, the total installed capacity of power generating plants was 2.3 million kw. The target for the First Plan was fixed at 1.3 m. kw. of additions. Work on a number of major river valley projects like Bhakra-Nangal, Hirakud, Chambal, Koyna, Rihand and D. V. P. was started during this plan. The total installed generating capacity increased to 3.4 m. kw. by 1955-56, against the target of 3.6 m. kw. The total generation in 1950-51 was 6,573 m. kwh. per year, which rose to 10,776 m. kwh per year in 1955-56. The per capita consumption went up from 18 units to 26 units; the total circuit length of transmission lines of 11 K. V from 29,272 km. to 51,427 km.; and the number of electrified villages rose from 3,623 to 9,609.

1. Ministry of Energy. *Report of the Department of Power, for 1977-78* p. 81.

During the *Second Five year Plan* period, a target of 3.5 m. kw. of additional generating capacity was fixed. The actual achievement was of the order of 5.65 m. kw. against the target of 6.9 m. kw. The total generation rose to 20,123 m. kwh per year by 1960-61, and the per capita consumption stood at 38 units. About 16,660 villages were electrified and total circuit length of transmission lines increased to 141,450 km.

In the *Third Five Year Plan*, a target of about 7 m. kw. of additional generating capacity was fixed. The actual achievements were of the order of only 10.17 m. kw. against the target of 12.7 m. kw. The total generation of power was about 36,403 m. kwh a year. The per capita consumption rose from 38 units to 61 units and the number of electrified villages to 44,494.

By the end of March 1970, the installed capacity was of the order of 15.49 m. kw. ; and the output per year was 56,190 m. kwh. the length of transmission line was 447,000 km. and the per capita consumption was 83 kwh per year. The number of electrified villages rose to 85,420.

The target of raising the installed generating capacity was placed at the end of the *Fourth Plan* at 23 million kw. The aggregate installed capacity of 23 m. kw. sufficient to meet a peak load demand of 16.4 m. kw. as against the total requirement of 18.5 m. kw. by the end of 1973-74.

The progress during the period covering the *Third Plan*, the three Annual Plans and the *Fourth Plan* was substantial, with installed capacity rising to 184.6 lakh kwh.

The main emphasis of the power programme in the *Fifth Plan* is on speeding up the construction and commissioning of power generation projects and improving the utilization of the available capacities. Power stations with a total installed capacity of 53 lakh kw. were commissioned during the first three years of the Plan to bring the total installed capacity to 237 lakh kw. By 1977-78, it is expected that installed capacity of about 24 lakh kw. will have been added, bringing the total installed generating capacity to about 260 lakh kw.

The following table shows power progress since independence.

Progress of Power Development Since Independence

	Beginning of the First Plan	End of First Plan	End of Second Plan	End of Third Plan	End of March 1969	End of Fourth Plan (1969-74)	Upto end of 1974-77
1. Installed capacity (m. kw.)	2.30	3.41	5.65	10.17	14.29	18.45	23.66
2. Output per year (m. kwh.)	7,514	11,872	20,123	36,825	51,700	72,796	95,280

3. Length of Transmission Lines—II KV and above (Circuit km.)	39,380	58,427	146,727	278,028	389,100	1422,204	7630,000
4. Capital Outlay (Rs. crore)	190	492	1,017	2,351	3,629	6,612	3,322
5. Per capita consumption (kwh per head per year)	17.8	26.4	38.2	61.0	61.6	96.5	118.8

Installed Capacity and Energy Generated during the Plan Period¹

	1960-61	1965-66	1973-74	1976-77
Total Installed Capacity (lakh kw)	56.5	101.7	184.6	236.6
Hydro Capacity (lakh kw)	19.2	41.0	69.7	90.3
Thermal Capacity (lakh k w)	34.0	60.7	108.9	139.9
Diesel Capacity (lakh kw)	3.5	4.2	3.4	—
Total energy generated (crore kwh)	2,012	3,682	7,279	9,528
Hidro (cr. kwh)	784	1,523	2,897	3,479
Thermal (,)	1,228	2,160	4,142	5,724
Nuclear (,)	—	—	24	33

The Fifth Plan observed that “the fulfilment of the targets would largely depend on the improvements in planning, designing, financing and implementation which have to be effected. The success of these measures would in turn hinge on rationalising, re-structuring and strengthening of organisational set-up of the power supply industry at different levels.”

Growth of Hydro Generating Capacity in India²

Year	In million kw	Year	In million kw.
1905	0.009	Beginning of First Plan (1950-51)	0.56
1910	0.015	End of First Plan (1955-56)	0.94
1915	0.071	End of Second Plan (1960-61)	1.62
1920	0.074	End of Third Plan (1965-66)	4.12
1925	0.152	Three Annual Plans (1966-69)	5.91
1930	0.287		
1935	0.343	1973-74	6.96
1940	0.442	1977-78	9.69
1945	0.475		

1. India, 1977 and 1978, p. 266.

2. Draft Fifth Five Year Plan, Part II, p. 118.

In March 1977, there were 44 major hydel power stations, and 48 major thermal stations having an installed capacity of 50 mw, and above:

Some of the major power projects, in operation and under construction and the benefits expected from these are given below :

Major Hydro Power Projects

Stations in operation	Capacity (MW)	Schemes under Construction	Capacity (MW)
1 Northern Region			
Bhakra Nangal	1205	Lower Jhelum (unit II & III)	105
Ranapratap Sagar	172	Yamuna Stage II (Khodri)	120
Rihand	300	Rishikesh Hardwar	144
Chibro	240	Beas Stage I	990
Obra	99	Beas Stage II	360
Ramganga	198	Baira Siul	180
		Salal	345
2. Western Region			
Ukai	300	Kadana	240
Gandhi Sagar	115	Pench	160
Koyna	540		
Koyna III	240		
Bhira	132		
3. Eastern Region			
Balimela		Subranrekha (unit II)	130
Hirakud		Rengali	100
		Upper Kolab	240
4. North Eastern Region			
		Loktak	105
		Khopoli	150
5. Southern Region			
Laver Sileru	200	Upper Sileru	
Upper Sileru	120	Sri Sailam	
Machkund	115	Nagarjunsagar	
Sharvathy	891	Kalindi stage I	
Jog	120		
Sabrigiri	300		
Idikki	390		
Kundah I to V	425		
Mettur Tunnel	200		
Periyar	140		
Kodayar 1 & 2	100		
Sholayar 1 & 2	95		

Areal Development of Hydro-power

1. *South India* (comprising Karnataka, Tamil Nadu and Kerala State). Due to long distance from collieries the use of coal for generating power is very costly and therefore, greater development of power is from water, 80% is hydel and only 20% thermal. In Mysore the hydro-electric stations are Sharavati, Sivasamudram, Shimsa and Jog. These are interconnected and are of about 1 million kw. They supply power to Karnataka. One of the important loads supplied by this system is in the Kolar gold fields. In Tamil Nadu there are 3 hydro-electric stations at Pykara, Mettur and Papanasam. These three are interconnected and serve mostly south Tamil Nadu, with about 0.8 m. kw. There is a big thermal station in Madras city which is connected with Mettur station. The capacity of the interconnected system of these stations is augmented by a steam power station at Madurai. Besides, there are two more thermal stations at Bijaiwada and Vishakhapatam. In Kerala there is a hydro-electric station at Pallivasal (with about 0.5 m. kw.) which is said to be mostly responsible for the development of the aluminium, fertilizer and chemical industries in the State. The two distinct features of the electric development in this zone are that these schemes, specially the generating stations and main transmission lines, are State-owned, and though the aggregate capacity is not very large, they are extending power supplies to rural areas for agricultural and other purposes.

2. *Gujarat-Maharashtra Area*. Of the total installed capacity 60% is hydel and 40% thermal. This zone contains Koyna hydro, Tata hydro-thermal, total about 1.2 million kw. ; and Gujarat nearly 0.5 m. kw. The major public utility stations are the three hydro-electric stations at Khopoli, Bhivpuri and Bhira on the slopes of the Western Ghats between Pune and Bombay, belonging to the Tata Electric Agencies, and the thermal power station at Ahmedabad belonging to Ahmedabad Electricity Co. The Tata electric system is interconnected with the steam power station of Central Railway at Kalyan and serves the industrial installations in Bombay, specially the textile industry. The thermal plant at Ahmedabad supplies power to the textile mills there. Outside the industrial areas of Bombay and Ahmedabad there are Dhruvan, thermal stations at Surat, and Sholapur, sustained mostly by industrial load. The distinct features in this region are that outside the industrial centres of Bombay and Ahmedabad there is little electric development.

3. *Bihar-Bengal Area*. Ample supply of coal being available in Bihar and Bengal collieries electric development in these areas is based almost exclusively on steam power plants. Again the development is exclusively due to private enterprise. The largest of the power stations at present are the four steam power stations at Cossipura, New Cossipura, Southern and Mulajore, belonging to the Calcutta Electric Supply Corporation, and supply power to Calcutta industrial and residential areas. Other major public utility stations

are at Gouripore, Seebpore and Dishergarh in Bengal and Sijua, Jheria and Patna in Bihar. Besides, there are a good number of privately owned plants belonging to railways, collieries and other industries, the biggest of which belong to the Tata Iron and Steel Co. at Jamshedpur, the Indian Iron and Steel Company at Kulti and Hirapur, the Rohtas Industries Ltd., Dalmianagar, and the Aluminium Corporation of India near Asansol. Except in the city of Calcutta and a few large towns where domestic and other general demands come up to about 20% the remaining power development is due to industrial demand. Outside the industrial areas of Bihar and West Bengal there is very little electric development.

4. *Uttar Pradesh and Punjab Area.* The power is both thermal and hydel. The Uttar Pradesh Government has taken a lead in promoting electric development. There are 18 hydro-electric stations on the Upper Ganges canals at Bhola, Palra, Sumera, Salwan, Nirgajni and Bahadurabad, etc. They are interconnected with one another, and also with two steam stations at Chandausi and Harduaganj. A special feature of the Ganga Canal Grid scheme is the predominance of the agriculture and irrigation loads. In towns of U.P. like Agra, Allahabad, Varanasi, Lucknow and Bareilly power was supplied from steam stations belonging to Martin Burn, Ltd. (now taken over by the State Electricity Board). Supply in Delhi is obtained from the Central Generating Station, Delhi and in Punjab there is a big hydro-electric station at Jogendernagar, which serves important centres such as Amritsar, Jullundur, Ludhiana and Ferozepur and also continues to serve considerable areas in West Punjab (Pakistan).

5. *Central Region,* (Comprising of Andhra Pradesh, Madhya Pradesh and Orissa). Power is almost exclusively thermal. The important public utility installations are at Nagpur, Cuttack, Khaperkheda and Hyderabad. Besides, there are several power plants belonging to private industrial concerns such as collieries, cement factories, textiles, chemical, paper mills and ordnance factories, etc. The major part of the power generated in this region is by these plants, and therefore, through private enterprise.

It will be interesting to note that the total installed capacity of all these regions comes to about 14 million kw., i.e., 88 per cent of the total. The remaining power is scattered over the rest of the country.

Pattern of Electricity Consumption

The pattern of electricity consumption shows some interesting features, such as : (i) In the per capita industrial consumption of electricity including electric traction and water works Punjab leads followed by W Bengal, Maharashtra, Gujarat, Tamil Nadu, Karnataka, and Orissa, Assam ranks the lowest.

(ii) In the per capita irrigation consumption of electricity Tamil Nadu heads the list followed by the Punjab, Andhra Pradesh and U.P. Assam and West Bengal occupy the lowest rank.

(iii) In per capita domestic light and small power consumption Jammu and Kashmir stands first followed by West Bengal, Maharashtra, Tamil Nadu, Gujarat and the Punjab Assam occupies the lowest rank.

(iv) In commercial light consumption Maharashtra occupies the first rank followed by Tamil Nadu, W. Bengal, and Andhra Pradesh, Kerala ranks the lowest

(v) The per capita consumption of electricity was 38 kwh during 1960-61. It increased to 61.4 kwh by 1965-66 ; to 90.0 kwh in 1970-71 ; to 93 kwh in 1971-72 ; to 97.5 kwh by 1973-74 and to 118 kwh in 1977-78. Though industry continues to be the largest consumer accounting for nearly 70 per cent of energy sales, there has also been a significant increase in power consumption in the agricultural sector in recent years. In some states the agricultural load accounts for over 30 per cent of power consumption.

(vi) The other important feature is that of the installed capacity by type of the plant, steam plants, still account for 59% of the total installed capacity. In spite of the implementation of many multi-purpose river valley schemes, thermal power still dominates and this is one of the reasons for the high cost of electricity generation. The average cost of generation per kwh, for 1976-77, worked out at 0.49, 4.44 and 18.55 paise for hydro, thermal and diesel generation respectively. For hydro and thermal plants alone, the average cost works out to be 3.32 paise per kwh. In the USA power is being generated at a cost of 2 paise per kwh.

(vii) Yet another feature is that major power consuming centres are the large industrial and commercial cities like Bombay, Calcutta, Delhi, Bangalore, Ahmedabad, Nagpur, Pune, Hyderabad, Madras, and Kanpur, and the new industrial centres of iron and steel works, aluminium smelters, textile centres, major defence industries, fertiliser plants, chemical and petro-chemical works and all types of mechanical and electrical engineering works.

It is remarkable that the bulk of underdeveloped hydro-potential is in Arunachal Pradesh, Assam, Meghalaya, Jammu and Kashmir, Himachal Pradesh and Madhya Pradesh. The development resources have been retarded in the part due to a number of factors, such as :

(i) The hydro-electric projects take relatively larger time for construction.

(ii) The location of many of these projects in inaccessible areas makes it difficult to carry out investigations and delays taking up of the construction works.

(iii) By their very nature, the hydro-electric projects require extensive site investigations in respect of hydrology, geology as well as topography, and formulation of sound and economic hydroelectric projects requires very thorough investigations and take considerable time.

(iv) The industrial states where the hydro-electric sites are located have neither the local demands to sustain a large programme of the hydel development nor the resources for developing them.

In view of the energy crisis that the country is facing, the Power Commission in 1962 and the Energy Survey of India Committee in 1965 have placed greater reliance on hydro-electricity development. After the tremendous enthusiasm for hydro-electric projects during the First and Second Plan, there had been a slackening of emphasis on hydro schemes. This has been an unwise step. Emphasising the fact that there is a need to reverse this trend, the Power Economy Committee (1971) in its report stated that, "Under the existing conditions in the country, the hydel schemes constitute the most economic source of electricity production... To control and reduce the cost of energy generation and supply in the country, to enable full utilisation of generating facilities already built up and to ensure that the limited capital allocations to power supply industry go to the farthest in meeting the country's estimated deficit, the bulk of new generating capacity to be added during the Fifth and Sixth Plans should be derived by hydro sources, both of energy intensive and peaking categories. The balance of new generating capacity should be derived from supersteam power stations employing the largest possible unit sizes and located at the coal washeries/coal mines. Nuclear power generating would have to be resorted to preferentially in areas with limited hydro resources and which are remote from collieries."

RURAL ELECTRIFICATION

Rural electrification is one of the most basic needs for transformation of rural life and agricultural production and is a key factor in the development of rural industries. It is vital for the socio-economic betterment of the people living in villages. By bringing electricity to the villages, to be used for domestic purposes and for pumping water from wells, cost can be reduced. Pumping water for irrigation by electricity costs only one-tenth of the cost of lifting it by bullock-power and one-third of that of using diesel engines. Besides, rural, industrial and employment potential that remains, even to this day, largely untapped, could be utilised and raise the income level and national output. Therefore, electricity in rural India's villages must be regarded as a vital need rather than an amenity or luxury.

The development of rural electrification is envisaged on the following grounds ;

(a) India is an agricultural country, where 80% of the people living in villages are still economically backward. From these villages there is a continuous drain of a large number of young people to the cities and towns in desperate search for a livelihood. This situation creates grave social and economic problems in the cities besides making the villages the home of decrepit fellows and brings about disintegration of rural family ties ; and impoverishing the rural areas with regard to enterprise, enlightened and progressive villagers and skill. This heavy exodus can be stopped by the quick introduction of rural electrification, through which a large number of agro-industries could be developed to provide employment opportunities to ruralities in their own villages and preserve the local talent for the development of the area itself.

(b) Agriculture is still a backward economy of subsistence type unable for producing food for the masses, mainly for lack of water supply. Wells are too deep in certain areas and drawing of water from these entail heavy burden on man and cattle. This could be reduced if electricity is used for installing pumpsets. Use of power can also modernise agricultural methods thereby increasing agricultural productivity.

(c) The Energy Survey Committee (1965) has estimated that about 100 million tonnes of firewood and about 55 m. tonnes of cowdung cakes are consumed principally for cooking and lighting purposes. This is due to non-availability of any other source of power. Its use led to continued denudation of forest cover and depriving the land of an important fertilizer. The study made by N.C.A.E.R. has revealed that a high proportion of energy in the rural domestic sector comes from the traditional non-commercial sources (cowdung accounting for 86 m. tonnes ; firewood 46 m. tonnes and vegetable waste, 26 m. tonnes respectively). This colossal waste could be stopped if electricity is provided for domestic consumption. Therefore, if forest plantations are not taken up immediately, the development of electricity in rural areas is a must which should receive an early attention.

Hence power must be taken in a big way into the farm and rural households. This should be in consonance with the policy of dispersal at industries in different parts with a view to bring about balanced regional development of areas which abound in a raw materials and human resources but lack sufficient supply of water and power. If India is to survive as a self-respecting nation, it is vital to ensure that power development in the rural areas proceeds along proper lines so that it may never suffer from want of Power and Food.

Development of the Programme

Keeping in view the paramount importance of electricity in rural life, concerted efforts have been made to accelerate the pace of

rural electrification. Starting from a mere 3061 villages electrified in 1951, it has been possible to electrify 222,869 villages by the end of March 1977, covering about 36 per cent of the villages in the country.

During the First and Second Plan period the stress was on the electrification of villages for providing employment opportunities in the rural areas. After the severe drought conditions of 1964-65, the stress was re-oriented towards energisation of irrigation pumpsets for increasing agricultural production. There were only 21,008 energised pump sets at the beginning of the First Plan. This number has increased to 33,41,305 at the end of 1978. The Fourth Plan did not specify any target in respect of electrification of villages as it was primarily oriented towards energisation of irrigation pump sets. The target was placed at energising of 12.50 lakhs with an outlay of Rs. 444.65 crores. The achievement during the Fourth Plan has been the electrification of 82,548 villages and energisation of 1352,307 irrigation pumpsets/tubewells. The total expenditure was estimated to be of the order of Rs. 750 crores.

During the Fifth Plan, it was proposed that at least 30-40% of the rural population in every State should receive the benefit of electricity. This will be made possible under the MINIMUM NEEDS PROGRAMME, for which an allocation of Rs. 272.3 crores has been made for extension of electricity in the backward areas and backward States. The total allocation for the programme of rural electrification in the Fifth Plan was Rs. 685 crores and the target was to electrify 81,000 additional villages and energisation of 13 lakh pumpsets. Against this target between 1974-75 and 1976-77, a total expenditure was of the order of Rs. 476.55 crores, 46114 new villages were electrified and 603,030 pumpsets energised during this period.

The progress achieved in the matter of rural electrification since 1947 is indicated below :

Progress of Rural Electrification¹

Year	No. of villages electrified	No. of pumpsets energised
on Dec., 1947	1,500	6,430
1950-51	3,061	21,000
1955-56	1,294	56,056
1960-61	21,750	198,904
1965-66	45,144	512,756
1968-69	73,732	1,088,804
1971-72	122,094	1,900,705

1. *Draft Five Year Plan 1978-83*, p. 164 *Ibid.*, p. 165.

1973-74	156,729	2,426,133
1974-75	172,169	2,611,982
1975-76	185,806	2,792,960
1976-77	202,869	3,041,305
1977-78 (Target)	222,869	3,341,305
1978-83 (Target)	100,000	2,000,000

Electrification of the rural areas will be intensified during the Five Year Plan, 1978-83. Twenty lakh pump sets will be energised and one lakh villages electrified during this period, as against 9 lakh pump sets and 80,000 villages in the four year period 1974-78. This will also include a coverage of about 40,000 villages under the Revised Minimum Needs Programme.

The following table gives the distribution of towns and villages in terms of population range, those electrified during different plans and those electrified by March.

Towns and Villages Electrified

Population range	Total Number of towns and villages electrified					
	as per 1961 census	1951	1956	1961	March 1969	March 1971
Up to 9,999	5,67,217	3,725	9,708	25,661	71,812	105,345
10,000-49,999	2,114	698	1,195	1,785	2,029	2,041
50,000-1 lakh	139	113	136	138	139	139
Over 1 lakh	107	101	104	106	107	107
Total	5,69,577	4,637	11,143	27,690	74,087	1,07,632

A few facts about rural electrification may be noted :

(1) The rural electrification programme has been concentrated among villages in the population range of up to 10,000, with a coverage, of only 19 per cent of the total number of villages.

(2) Out of a total number of lakh villages, upto March, 1977, 2.22 lakh have been electrified, i. e. hardly 36 per cent have the advantage of electricity.

(3) While in the country as a whole, 36 per cent of all villages have been electrified, the proportion in more than half of the states is below the natural level, such as in U. P., Bihar, Andhra Pradesh, Gujarat, M. P., Karnataka, West Bengal and Rajasthan, etc.

However, Haryana has been the first State to have achieved the goal of cent percent rural electrification on Nov. 2, 1970. In Kerala 96.4 per cent ; in Tamil Nadu 98.6 per cent and in Dadra and Nagar Haveli 68.1 per cent of the villages have been electrified so far.

(4) As compared to other countries, rural electrification has not made much headway in India. For instance, more than 66 per cent of the Newzealand's population is provided with electricity. This per centage is 75 in Tasmania, 90 in Japan, 90 in France, 93 in England and Wales as against only 16 in India. Agricultural areas electrified in Sweden is 65 per cent in Norway 55 per cent, in Den-

mark 85 per cent and Italy 95 per cent, and 100 percent each in Czechoslovakia, Holland, Belgium and Switzerland.

Suggestion for Further Development

The *sine-qua-non* of the development of outlying rural areas lies in the progress of rural electrification on a much larger scale than at present. A few suggestions may be offered in this connection.

First, it is not enough merely to make more power available to the rural areas but it is also necessary to ensure that connections are sanctioned and actually provided without delay.

Second, the villager seeking power connection is not confronted with conditions which are beyond his means or ability to fulfil.

Third, the electricity rates he has to pay should be reasonable. For this purpose the tariff structure should be rationalised and uniformity of rates should be brought about for a given class of consumer throughout each State, if not over the whole country. Besides, rural electrification programmes should be subsidised as has been done in countries like UK, USA, USSR, Japan, Norway, Canada and Newzealand.

Fourth, small diesel sets should be installed for supplying power in villages too far from the main supply lines. It should be economical and also should eliminate the need to maintain a diesel pumping set by each village.

Fifth, incentives like (i) free technical service and advice on the choice of pumpsets; (ii) creation of facilities for their installation as well as domestic wire installation, where necessary; (iii) facilities of hire-purchase of pumpsets; (iv) limiting the amount of security deposits payable by the consumer, and (v) the maintenance of pumpsets at nominal cost should be offered liberally.

Sixth, emphasis should be laid on the energisation of clusters of irrigation pumps keeping in view the groundwater availability in various areas.

Finally, rural electrification co-operative should be extended and these should be closely linked with the industrial processing co-operatives.

Rural Electrification Corporation

The R. E. C., with a plan outlay of Rs. 150 crores in the Fourth Plan, was set up in the public sector in 1969. Concessional financing is provided by the Corporation for schemes relating to backward areas which have an agricultural potential. It makes an integrated approach in projects by financing close monitoring, strengthening the distribution system and the reduction of system losses.

Up to June 30, 1978, the Corporation had sanctioned 1902 rural electrification schemes of the State Electricity Boards involving loans of Rs. 788.16 crores; as against Rs. 111.4 crores for 219 schemes in 1972-73. Corporations' actual disbursements during 1977-78 amounted to Rs. 175.3 crores on completion of the 1902 projects, 924,543 pumpsets would be energised, 140,147 Agro industries set up and 111,468 new villages electrified.

APPENDIX I
Progress of Rural Electrification
Number of Villages Electrified in India

State/Union Territory	Total Numbers		Number of Villages Electrified ending March									
	1971	1961	1951	1956	1961	1966	1971	1975	1976			
Andhra Pradesh	27,221	27,084	119	517	2,433	4,099	8,078	10,430	11,358			
Assam	21,995	20,564	—	—	13	66	618	1,359	1,769			
Bihar	67,566	67,665	4	300	2,305	3,744	7,741	14,779	16,565			
Gujarat	18,275	18,584	37	130	678	1,671	3,907	6,026	6,305			
Haryana	6,731	6,669	—	99	570	1,179	5,443	6,731	6,731			
Himachal Pradesh	16,916	13,060	9	93	670	1,438	2,944	6,276	6,721			
Jammu and Kashmir	6,503	6,559	—	—	32	383	685	1,658	2,196			
Kerala	1,268	1,573	159	381	872	1,082	1,196	1,182	1,202			
Madhya Pradesh	70,883	70,414	9	47	373	1,133	3,906	11,304	11,822			
Maharashtra	35,778	35,851	33	237	764	4,273	12,197	18,643	19,309			
Manipur	1,949	1,866	9	12	29	115	187	217	231			
Meghalaya	4,583	4,047	—	—	7	23	66	185	261			
Karnataka	28,826	26,377	551	1,570	2,920	4,627	8,328	13,730	14,209			
Nagaland	960	814	—	—	7	11	65	156	175			
Orissa	46,992	48,466	—	25	118	534	1,697	10,128	11,507			
Punjab	12,186	11,947	42	369	1,712	3,697	6,179	7,717	4,926			
Rajasthan	33,305	32,241	2	5	46	1,115	2,933	6,326	7,053			
Tamil Nadu	15,735	14,124	1,495*	2,430x	5,919*	7,830	11,166	15,473	15,509			
Tripura	4,727	4,932	—	—	13	31	66	111	170			
Uttar Pradesh	112,561	112,624	110	420	1,082	5,855	20,719	30,798	31,862			
West Bengal	306,074	38,454	386	535	920	1,594	2,966	9,257	9,825			
Union territories	4,685	4,602	96	106	268	643	861	1,042	1,092			
All India	575,936	567,338	3,061	7,294	21,750	45,144	104,938	173,533	185,806			

* As per 1951 Census

Indian Agriculture in Brief, 1977, pp. 252-253

10.

Manures and Fertilizers

Soils and Losses of Nutrients

No two soils are alike in either the nature or the quantities of plant nutrients they contain. The quantities of both organic and inorganic matter found in the soil vary greatly from soil to soil. A great majority of the Indian soils fall within the range of 670 and 4,480 kgs. of total nitrogen per hectare, the average being perhaps in the neighbourhood of 1,120 kgs.¹ In the matter of phosphorus, majority of the soils fall within a range of slightly less than 10 to about $\frac{1}{2}$ kg. per hectare, the average being less than 28 kgs. per hectare, a quantity barely sufficient to produce a fairly satisfactory crop yield.² The majority of Indian soils have relatively large reserves of potassium, the average total potash content being of the order of 9,000 to 11,000 kgs. per hectare.³

The All-India soil test summarises (prepared upto 1964) showed that about 52% of soils were low, 32% medium and 16% high with respect to nitrogen; 31% were low, 39% medium and 30% high with respect to available potash; and 52% of soils were low, 30% medium and 18% high with respect to available phosphorus.

The deficiency of the different soils is due to a number of reasons. (i) By far the largest loss of soil nutrients is brought about through the removal of harvested crops from the land. Land in India has been used for centuries for producing crops without proper manuring, which practice has completely exhausted its fertility. *It is a fact worth noting that not only Indian soils are usually very poor in organic matter as well as nitrogen but they have also been further made poor by not putting back into the soil, what has been taken out of it through constant cultivation.* Hence, farming has become a sort of marginal enterprise. Here the farmer takes out of the land only the bare minimum because he is not in a position to put back anything substantial into it. "The extra crop in England", says Dr. Voelcker, "is....the produce of what is added to, and not, as in India....of what is taken out of it."⁴ According to Howard, "He does more with a little nitrogen than any farmer in the world

1. S. P. Raychaudhry, *Land and Soil*, p. 58.

2. *Ibid.*, p. 62.

3. *Ibid.*, p. 66.

4. Voelcker, J. A, *Op. Cit.*, p. 41.

outside China. He uses his supply of nitrogen carefully, because he lacks funds to buy manures and fertilisers that can re-endow his land with chemical elements through farming."¹ At another place he says, "the using up of soil fertility as a transfer of past capital and of future possibilities to enrich a dishonest present, it is banditry pure and simple. Moreover, it is a mean form of banditry because it involves the future generations which are not here to defend themselves."² No wonder then, that fertility of the soil in many a part is gradually declining.

Nutrients Removed by an Acre of Harvested Crop

<i>Crops</i>	<i>Nitrogen</i>	<i>Phosphatic Acid</i>	<i>Potash</i>
<hr/>			
Rabi Crops	(In lbs)		
Wheat	50	21	61
Barley	37	18	31
Gram	70	20	44
Oilseeds	18	10½	25½
Kharif Crops			
Paddy	30	20	60
Maize	32	21	35
Jowar	50	16½	65
Bajra	32	20	59
Ragi	32	20	59
Groundnut	70	20	40
Sugarcane	90	180	300
Cotton	55	30½	82
Sesamum	20	10	80

The total quantity of nitrogen removed from the gross cropped area, at 1960-61 level of production, has been estimated at about 3.0 million tons.

1. A. Howard, *An Agricultural Testament*, p. 210.
2. A. Howard, *Farming and Gardening for Health or Disease*, pp. 69-70.
3. P. C. Raheja, "Fertilizers The Answer to Falling Fertility," *Indian Farming*, July 1955.

Nutrients Removed by Major Crops at 1960-61 Level of Production

Crops	Yield per kg.	Nutrients Removed per acre grain straw $N P_2O_5 K_2O$ (in pounds)				Area in 1960-61 (million acres)		Total Nutrients $NP_2O_5K_2O$ (Thousand tonnes)	
Paddy	11.01	28.1	11.4	43.2	83	978	397	1504	
Wheat	9.13	15.8	7.2	19.0	31.3	215	98.0	259	
Jowar	5.87	9.0	5.5	24.9	42.0	173	106.0	478	
Barley	9.41	22.1	8.8	21.1	7.9	83.0	33.0	79.0	
Bajra	3.04	7.8	2.7	24.3	28.0	97.5	34.0	304	
Cotton	1.98	3.9	1.4	2.8	18.97	35.0	12.5	25.0	
Jute	12.81	49.6	—	—	1.3	31.0	—	—	
Sugar Cane	41.25	45.8	137.5	28.4	5.8	94.0	282	58.0	
Ground nut	7.67	29.1	5.4	17.0	15.45	165	31.0	96.0	

(ii) Losses of nutrients by leaching do occur under heavy monsoonal rains. Sandy soils are more subject to leaching than the heavier ones, and bare soils are more than those covered by plants. It has been estimated that loss of nitrogen by leaching is less than one-tenth of that caused by crop harvest, loss of potassium is appreciably less than that of nitrogen, and loss of phosphorus negligible.¹

(iii) Soil erosion is another cause of loss of soil nutrients due to the removal of surface soil. If one-tenth of the top soil is washed away, more than one-tenth of the nutrients of the top soil are lost. Since an actual physical loss of the soil is involved, losses of nitrogen, phosphorus and potassium are proportionately the same.

Evidence of Soil Exhaustion

The best indication that the soil is exhausted of its fertility can be obtained from the poor growth and less outturn. Where a fertility is thus recorded one may be sure that either the nitrogenous or the phosphatic fertiliser is required, because the potash salts are generally found sufficient in our cultivated fields.²

With every crop removed from the land, the soil is depleted of three important plant nutrients, *viz.*, nitrogen, phosphoric acid and potash, and the quantity removed varies with the kind of crops grown. To say only of nitrogen, it may be noted that as much as 84 lbs. are removed per acre in the case of tobacco, 80 lbs. in case of groundnuts, 60 lbs. in case of jute, 50 lbs. each in case of wheat and jowar, 40 lbs. in case of tea and 27 lbs. in case of cotton.³

1. S. P. Raychaudhry, *Op. Cit.*, p. 106.
2. Mitra, S. K., *Elementary Agriculture*, p. 164.
3. I. C. A. R., *Handbook of Agriculture*, p. 80.

The deficiency of combined nitrogen is the limiting factor throughout the greater part of India, for humus called the '*Reserve Bank of Soil*' is getting depleted.¹ Examples are not wanting which may throw light on the steady deterioration of soil resources.

"Most of Indian soils had reached their maximum state of impoverishment hundreds of years ago and would not get any poorer if cropped without manures for hundreds of years more." *Dr. Clouston.*²

"A balance between the natural grains of plant food materials and those removed by crops and other losses has been established and no further deterioration is likely to take place under existing conditions. *Royal Commission on Agriculture.*³

"Land is going out of cultivation. The deterioration of land has already proceeded so far that it cannot be checked, and that the tracts in Burdwan and Hooghly are shrinking." *Dr. R. K. Mukerjee.*⁴

"The soil tests conducted all over the country have shown that in 47% of the districts the soils are deficient in phosphorus and 48% cases have medium supply of phosphate. In 20% of the districts, deficiency of potassium is met with. The micro nutrient deficiency (particularly of zinc) is very wide-spread. In some areas, deficiency of calcium magnesium and sulphur is of common occurrence As more and more intensive cropping is adopted and higher yields obtained, the problem of soil fertility will become more important.....We cannot draw upon the soil bank without restoring to it what the crop removes.....It is necessary to take steps to remedy this defect."

In Punjab and Maharashtra a considerable amount of land has gone out of cultivation.⁵ In M. P. and Rajasthan the soils have reached a stationary state of fertility at a low yield level as a result of continued cropping without adequate return of organic matter and lack of proper soil management in certain important directions. What is true of these states is also true of the whole of India.

The Royal Commission on Agriculture has rightly remarked. "The impoverishment of the soil is due to continuous cropping."⁶ According to another authority the deterioration of land in India is due to lack of humus and fertilizers and the practice of using cowdung

1 "Soil is like a bank. You cannot take from it more than you deposit. Nature permits no overdrafts Hence not only the fertility of the soil is to be conserved but also enriched " Charan Singh, *Joint Farming X-Rayed*, 1959, p. 261-262.

2. *Report of the Royal Commission on Agriculture*, p. 76.

3. *Ibid.*

4. R. K. Mukerjee, *India Analysed*, Vol. III, pp. 196-197.

5. Lander, *Proceedings of the Second Meeting of the Crops and Soils Wing of the Board of Agriculture*, p. 43.

6. *Report of Royal Commission on Agriculture*, p. 76.

as fuel—characteristic of the last stages of soil exhaustion.¹ Therefore, *the problem is not of preventing further deterioration of soil fertility but is one of finding way of improving the soils which have more or less reached a minimum stage of fertility.*

Estimates of Removals of Nutrients from the Soil

As noted earlier, different crops remove different quantities of nutrients from the soil. It is estimated that the principal crops grown in India remove about 18.4 m. tonnes of nutrients from the soil each year. In terms of chemical fertilizers the removal rate is 4.2 million tons of nitrogen, 2.1 million tons of phosphoric acid, 7.3 million tons of potash, and 4.8 million tons of lime per year.² In contrast to this removal, only 2 million tons are being returned to the soil and the recurring annual drain runs to about 11.6 million tons.³ This continued drain will further impoverish the soil, unless it is replenished by natural or artificial means.

The principal methods for supplementing natural recuperation and for improving productive capacity are : (i) to add organic matter *i.e.*, *manures*—(animal or green) to the soil so that, through decay, it may furnish a more or less continuous supply of nutrients for crops ; and (ii) to restore or increase the fund of the deficient nutrients by the application of fertilizers (popularly known as *chemical*, *artificial*, or *in-organic* manures). It needs hardly be said that the optimum manuring of crops is only next to irrigation in its ability to increase the yield per acre. The minimum additional yield on this account can safely be placed at 25 to 35 per cent ; and more in the case of irrigated crops.⁴

Low Consumption of Manures and Fertilizers on Cropped Lands

The Indian farmer knows fully well that his fields can produce a larger amount of crops if they are properly manured. But unfortunately he is not fully applying adequate manures to his field. Several reasons are responsible for this :

- (1) Lack of fuel forces the cultivators to burn cowdung. According to the findings of I.C.A.R. as much as 200 million tons of cowdung are burnt in rural India per year⁵. This results in a great agricultural loss for, according to Dr. Voelcker there is a waste of 29.95 lbs, out of 30 lbs. nitrogen found in every ton of farmyard manure.
- (2) Improper storage and defective maintenance of farmyard manure in open spaces on the outskirts of the village so that much of the valuable gases are lost and its manurial

1. Orr, Boyd, *White Man's Dilemma*, 1953, p. 69.

2. I. C. A. R. *Op. Cit.*, p. 81.

3. *The Eastern Economist Annual*, 1960, p. 60.

4. I. C. A. R., *Op. Cit.*, p. 82.

5. N. C. A. E. R's publication, *Domestic Fuels in India*, 1959, put this figure at between 80 to 260 million tons, pp. 3-4.

- (3) Due to sheer religious susceptibilities and conservatism of the farmers neither full use is made of human excreta nor of bones, bonemeal, bloodmeal, fish etc. For lack of food supply, even green manuring is not resorted to as land has to be put under food crops.
- (4) Poverty of the cultivators and inadequate credit facilities are a great hindrance in getting manures in adequate quantities. Wherever they are used the crops grown are specially the cash crops.
- (5) The use of artificial fertilizers has also been small partly because of high prices and inadequacy of water supply, and partly because of the weakness of the cultivators and fear of loss of crop through their improper application.
- (6) The inherent problem of the education of the cultivator has so far stood in the way of rapid expansion of the use of fertilizers.

As a result of the above factors, it is then not surprising to find that only about 10% of the farmers use fertilizers. Recent studies conducted by N.C.A.E.R. and I.C.A.R. show that the actual dose of nitrogen, phosphatic and potassic fertilizer fall substantially short of the officially recommended doses in all areas covered by the surveys. "On an average, doses applied are less than 1/4th in the case of nitrogen, less than 1/8th in the case of phosphatic and 1/4th for potassic fertilizers of the recommended rates of application Out of a total gross cropped area under irrigated and rain-fed conditions, nitrogenous fertilizers were applied to only less than half of the area. Only 35% of this gross cropped area has received phosphatic and potassic fertilizers." This evidently shows that the larger tracts yet remain to be fertilised.

The second fact to be noted is that most of the fertilizers go to cash crops like cotton, sugarcane or to wheat and paddy or to garden vegetable crops. Maize, Bajra, Jowar also receive fertilizers in case the seed is used hybrid. On the whole, about 70% of the fertilizers are used on food crops and that too on irrigated land.

Though consumption of fertilizers has increased in the recent past, their per hectare consumption is even now woefully low when compared with world standards. The per hectare consumption for Belgium 315 kg., New Zealand 37 kg., for France 162 kg., for U.K., 99 kg., for U.S.A. 85 kg., for Japan 328 kg. as against India's 15.8kg.¹

Our Manurial Requirements

The aggregate requirements of nitrogenous manures are enormous. One estimate has put them at 2.6 million tons of mixed

1. Fertilizer Association of India, *Fertilizer Statistics*, 1974-75.

nitrogen a year.¹ About 40% of the cowdung is used for fertilising the soil. 20% is lost partly due to bad methods of preservation and 40% is burnt up for want of cheap fuel.² It has been estimated that 20 lb. of nitrogen per acre would be the minimum required, and the quantities in terms of different manures—organic and inorganic—for the whole of the rice area alone, would be over 2,500,000 tons of ammonium sulphate, 10 million tons of oilcakes and 100 million tons of compost. For all crops taken together the quantity required would be very much greater. As against this total requirement we are told that the total production of fresh dung is 800 million tons—of which only 2 to 3 million tons are left for soil, the rest being wasted or burnt as fuel.³ Shri Bansil opines that India would need a minimum of 9 million tons of nitrogen by 1985 for self-sufficiency in agricultural commodities.⁴ On the basis of the soil tests and of fertilizers, Dr. B. Ramamoorthy and his colleagues have calculated that to produce the food and other products, India may need, by 2000 A.D. a minimum of 4.60, 3.94 and 1.92 million tons of nutrients N, P₂, K₂, O respectively. These figures show the magnitude of the manurial problem which has to be solved, and the technological possibilities of increasing the yield of crops by means of manures are to be translated, into practical possibilities.

Nature and Function of Manures

A manure is "a substance designed to supply one or more of the essential constituents of plant food and, where necessary, to improve the physical condition of the soil to which it is applied." The essential constituents of plant food must contain these elements—carbon, hydrogen, oxygen, phosphorus, sulphur, lime, magnesia, iron and probably silicon, chlorine, sodium, calcium, zinc and chloride, etc. Of these carbon hydrogen and oxygen and some of the nitrogen are derived from air and rain; most of the nitrogen and the remaining elements being obtained from the soil. Almost every soil contains enough lime, magnesia, sulphur, iron, silicon, chlorine and sodium for the growth of a full crop but nitrogen, phosphorus and potash are often present but in small quantity and become exhausted by the removal of farm produce. Hence, the addition of manure is indispensable to supply the deficiencies of these three constituents in the soil. But as some crops either contain excess of one or other of these, or are better able to obtain some one or other of them from the soil than are other crops, it is most economical to apply a special manure to meet the needs of such crops.

1. Randhawa, *Development of Agriculture and Animal Husbandry in India*, p. 70.

2. *Proceedings of the Eighth Meeting of the Crops and Soils Wing of the Board of Agriculture*, 1952, p. 219.

3. *First Five Year Plan*, p. 255.

4. P. C. Bansil, *Agricultural Planning for 700 Millions. A Perspective Study* 1971, p. 291.

All manures have a complex action in the field ; (1) feeding the crops, (2) altering its habit of growth, its feeding value, its qualities, market price, etc. (3) acting on the soil and affecting tilth moisture holding capacity, draft of implements, etc. (4) making the soil acid or alkaline according to the nature and circumstances of the case, (5) enabling crops to make the most of their short growing period by supplying available food just when most needed ; and (6) giving each just what is needed but which it has most difficulty in getting for itself.

The nitrogenous deficiency of the soils can be overcome by : (a) the careful conservation and proper use of farmyard manure, (b) the manufacture of composts from village and town refuse, (c) the use of human waste, (d) animal produce (e) oilseed cakes, (f) the use of green manure, (g) rotation of crops, (h) mixed cropping, and (i) the use of chemical fertilizers. Farmyard manure is the mixture of the liquid and solid excrements of farm animals with straw used as litter. It is the most important of all fertilisers as it is supposed to contain all the ingredients required for the growth of crops and also because it causes a certain amount of disintegration of the soil. In addition to its manurial properties, it has valuable physical effects upon the texture and water-holding powers of the soil and in dry seasons these may count for more than fertilizers towards ensuring good crops. It restores humus in the soil, gives cohesion to the sandy soils, and renders clayey soils more porous and workable. It serves as a buffer in the soil ensuring even distribution of inorganic plant nutrients to the roots of crops. Besides, such manures result in steadiness in yield over a period of time, benefit to the succeeding crops by their residual effects and ability to *withstand* unfavourable weather conditions.¹ It is, therefore, very essential when applying chemical fertilisers.

Average farmyard manure in India contains about 0.3 per cent nitrogen, 0.2 per cent phosphoric acid and 0.3 per cent potash. On the other hand, manure with no fodder mixed with it contains from 0.5 to 1.5% of nitrogen, 0.4 to 0.8% phosphoric acid and 0.5 to 1.9% of potash.²

It has been estimated that the cattle-shed manure supplies nearly ten times as much nitrogen and phosphoric acid to the soil as other manures and fertilisers put together and, this in spite of the fact that cattleshed manure is now prepared in a most crude and primitive manner in our villages and only half of the cattledung is used for manure production.

About 200 million tons of dry cow-dung having 15% of moisture, is being burnt yearly—the dry weight being equal to 170

1. *First Five Year Plan*, p. 255.

2. Daji, J. A., *Manures and Manuring*, Farm Bulletin No. 7. I. C. R. Delhi 1955 and Arakeri, H. R. and others, *Soil Management in India*, 1962, p. 82.

million tons. The value of three plant nutrients alone lost by burning cowdung has been estimated to amount to Rs. 382 crores per year at an average value of Rs. 1,500 per ton of nutrient. If cowdung were solely used as manure the net national annual drain on plant nutrients would be reduced by over 40 per cent.¹

Hence, every effort must be made to check the practice of burning cowdung as fuel. Sir John Russel has observed, "Wasteful practice making manure into cakes and burning it goes on unabated for the simple reason that no other equally useful fuel is available. The only way of stopping the practice, is to provide an alternative supply of fuel."²

The storage of farmyard manure presents considerable difficulties for when it is kept under the best conditions there will often be a loss of 15% of its nitrogen and it can be as much as 40% under ordinary methods of storage. Even under the covered-yard system, when the dung and litter are left under the animal until a layer several feet thick is produced and the product is protected from the weather as much as 15% of the valuable nitrogen is lost. When the dung is carted out into a heap to ripen, the losses of nitrogen are even greater. The wastes of plant food provided by the animals is greatest in the case of nitrogen and potash and this is, in main, due to the defective methods of manure preparation adopted at present in the villages which do not utilise cattle urine as much as possible.

Russel and Richards after carrying out an elaborate investigation on the storage of farmyard manure at Rothamstead concluded that (1) the system of leaving the manure under the beast till it is required for the fields as in the box or covered-yard system is the best whenever this is practicable, (2) the ideal method of storage is under anaerobic additions at a temperature of 26 C, (3) the manure heap, however, well made and projected, involves loss of nitrogen, and (4) the best hope of improvement lies in storing the manure in water-tight tanks or pits so made that they can be completely closed and thereby allow the attainment of perfect anaerobic conditions. Therefore, what is needed is a continuous system of preparing farmyard manure in which (a) all losses of nitrogen are avoided, and (b) the various steps from the raw material to the finished product follow a definite plan based on the orderly breaking down of materials and the preparation of finished product ready for immediate nitrification which can be easily incorporated in the soil. It must be remembered that well-rotted dung is richer and more active than comparatively

1. K. C. Pant, *Fertilisers for More Food* 1959 pp 22,23. The Planning Commission puts this figure at 400 million tons of cowdung equivalent to 60 million tons of firewood, that is being annually burnt.—*Third Five Year Plan* 1961, p. 362.

2. "If instead of being used for fuel, the dung could be put on the soil, preferably after composting it with waste vegetation, then the fertility of the soil, would greatly increase. Thus India could come far closer to feeding herself and be that much safer from famine"—Richard B Gregg, "One Way to Increase Food Production" *National Herald* dated March 23, 1958.

fresh undecomposed material, and hence, it is wasteful to turn heaps of manure to get at the well rotted material for top dressing. Directly the heap is broken it should be used.

In tracts of adequate rainfall and irrigated areas, the application of bulky organic manures will go a long way in maintaining and improving soil fertility. A basal dose of 10 tonnes of bulky organic manures per hectare in such tracts every year is needed. In the dry farming areas addition of 5 tonnes of bulky organic manures per hectare generally helps to increase the moisture conserving capacity of the soil.

The total requirement of such manures is about 1150 m. tonnes. By 1965-66, the production of bulky organic manures was about 482 m. tonnes only : 1973-74 it was of the order of about 510 m. tonnes. In 1977-78 the total production was of 205 m. tonnes of rural compost and 6 m. tonnes of urban compost.

On an average, about 20 to 25% of nitrogenous requirements of the soil are being supplied from farm yard manure.

"Farmyard manure can be applied to all crops grown in the rainy season or under irrigation. The quantity to be applied varies from 3 to 5 cartloads per acre in areas having less than 30" of rainfall to 8 or 10 cartloads in areas of heavier rainfall.... For irrigated field crops the rate varies from 10 to 20 cartloads. Sugarcane, maize and garden crops, vegetables and fruits receive higher doses, amounting to 40 to 50 cartloads."

"The use of farmyard manure alone causes an imbalance in nutrition due to its relatively low content of phosphoric acid. Therefore, to keep the soil well supplied with all essential plant foods in a readily available form, and also to keep them in good 'heart' bulky manures must be used in conjunction with superphosphate and other artificial fertilizers as contain the particular plant food or foods in which a soil may be deficient or which the crop to be grown may specifically require. The one will improve the physical condition of the soil and the other will supply the required quantities of plant food to produce a good crop."

(b) Village and Town Refuse Compost. Compost is another local manure which is made from a variety of refuse available both in the rural areas and the city. In rural areas usually all types of cattle and human wastes are made use of. Such manure is the *rural compost*. On the other hand, *urban compost* is made of municipal wastes and night soil. It is consumed within the city areas. Under schemes for manure preparation in villages particularly in the Community Development Projects composting of farmyard manure and other wasteful material has become increasingly popular. The village compost scheme is working satisfactorily specially in the Punjab

and U.P. The Punjab has adopted trenches 25 ft. in length, seven to eight feet in breadth and three feet in depth, whereas in U.P. the department has pits twelve and a half feet in length, eight feet in breadth and two to three feet in depth. One trench of the U.P. dimensions would be necessary for a household. Some trenches, with pits smaller in length, can be located even in the congested areas. The trenches are filled up in breadth-wise sections with the material already used in the cattle-shed for absorbing cattle urine. In addition to dung-waste, litter and waste of horses and poultry combined with herbage, straw garbage, urine and other habitation wastes such as household sweepings, wood-ash and leaves, etc., are also added. No turnings are necessary, but when each section in four or five days reaches to a height of one and a half or two feet above the ground level the top is plastered over with a paste of cattle dung and earth (equal parts by weight) in order to conserve moisture and nitrogen and to prevent fly-breeding. The manure is then ready in four to six months' time, and a rich product containing over two per cent nitrogen (on dry basis), obtained which would increase crop yields by 25 to 50%¹

Besides rural composting, there exist vast resources of urban waste which are useful for growing vegetables and short duration crops. These urban wastes are of two kinds: (i) *solid wastes*, which include city sweepings, garbage, kitchen wastes, slaughter-house waste, night soil and industrial organic wastes, and (ii) *liquid wastes* like sewage and sullage, comprising all waste and night soil.

The production of urban compost increased from 2.6 m. tonnes in 1961-62 to 3.4 m. tonnes in 1965-66. It was 3.6 tonnes in 1966-67 ; 4.1 m. tonnes in 1968-69 ; 4.2 m. tonnes in 1969-70 ; 4.3 m. tonnes in 1970-71 ; 4.4 m. tonnes in 1972-73; 4.6 m. tonnes in 1973-74; 4.8 m. tonnes in 1975-76; 5.4 m. tonnes in 1976-77 and 5.8 m. tonnes in 1977-78. During The Fifth Plan, 35 compost plans are to be set up.

The town compost contains, on an average 1.3% nitrogen, 1.1% phosphoric acid and 1.5% of potash on dry basis.

The treatment of sewage results in production of sludge which is a valuable manure. It is estimated that about 2 lakh tonnes of sludge could be available per year by such treatment. As against the

1. In this respect Plant Research Institute at Indore has done exceedingly well in using various wastes for compost making. Here the following materials have been utilised in making compost :

- (a) Residues which are available in large quantities : cotton stalk, sannhemp, sugarcane trash, weeds, fallen leaves, pigeon pea stalks.
- (b) Residues available in moderate quantities : mixed dried grass gramstalks, wheat straw, uneaten decayed silage, groundnut, and stalks and leaves damaged by rain, sugarcane and millet stumps.
- (c) Residues available in small quantities : waste paper and packeting materials, shaving, saw dust, torn out gunny bags, torn out uniforms and old leather belting.

potential, the present availability of sludge is only 50,000 tonnes. The compositions of sludge is 30% nitrogen, 2.0% phosphoric acid and 0.5% potash.

The production of rural compost increased from 66 m. tonnes in 1955-56 to 115m. tonnes in 1965-66. Its production was 144 m. tonnes in 1968-69, 145 m. tonnes in 1969-70, 155 m. tonnes in 1970-71, 170 m. tonnes in 1973-74; 184 m. tonnes in 1975-76; 200 m. tonnes in 1976-77 and 205 m. tonnes in 1977-78. The Fifth Plan target is 350 m. Tonnes.

There are at present many bottlenecks which are hampering the intensification of compost preparation work in the urban centres: (i) The arrangement made for the renewal of urban wastes by the municipalities or local bodies are inadequate. This factor hinders off-take of compost, which restricts further compost productions: (ii) the poor financial position of the municipalities and local bodies, (iii) lack of special staff to organise compost work; (iv) delay in aquisition of lands for composting grounds; and (v) apathy and lack of interest on the part of sanitary inspectors in charge of compost work are important reasons for the slow progress in the urban camposting programme.

Good quality manure can result by ensuring : (i) maximising collection of cowdung and urine fraction through the use of vegetable litter/earth ; (ii) optimising carbon/nitrogen ratio by mixing the nitrogen rich materials with carbonaceous materials, (iii) preparing manure in a scientific way ; (a) in trenches of suitable sizes partitioned into sections ; (b) avoiding leaching and seepage losses by making *pucca* trenches ; (c) filling the trenches layer by layer, (d) ensuring optimum aeration, moisture, temperature and pH for proper decomposition ; (e) adding sufficient quantity of superphosphate which not only controls nitrogen losses but also makes up the phosphorus deficiency in the final manure ; and (f) covering the trenches so as to avoid volatalisation losses and percolation of rain water ; and (iv) mixing the manure in the field by ploughing as soon as possible otherwise heaping it in open would lead to volatalisation losses.¹

While the potential capacity for composting of urban wastes is about 80 lakh tonnes, actual utilization at present is only 58 lakh tonnes. In addition to this, of the total availability of 700 m. gallons of sewage and sullage per day, only 200 m. gallons in being used. The remaining quantity is discharged into rivers and streams causing pollution of water detrimental to human health. This can be utilized in a number of urban areas. *The Committee on Natural Resources* has shown that it is very necessary that adequate areas are earmarked for sewage farming in our growing towns which

1. O. P. Vimal, "Rural Prosperity Through Waste Utilization" in *Khadi Gramodyog*, vol. xxi, No. 6, March, 1975, p. 276.

should not be built upon. Effective utilization of city wastes, including sewage and sullage, would mean not only increased agricultural production but also cleaner cities. Mechanical compost plants should be set up in selected cities to make organic manures from city waste.

The total quantity of sewage/ sullage available in 80 cities and 600 towns is estimated to about 700 m. gallons per day, out of which about 240 m. gallons are being used at present for irrigation in about 145 cities and the area receiving irrigation is about 13,360 hectares. The discharge per day can irrigate about 210,000 acres. The extra produce in terms of food grains would be about 3 lakh tonnes, besides helping in the production of crops like plantain, papaya, fodder crops, sugarcane, tobacco and cotton.

The area under sewage irrigation in 1974-75 was about 24,000 hectares. This is to be doubled by 1978-79. The Fifth Plan envisages establishment of gohar gas plants. About 50,000 such plants were set up during 1974-75 to 1976-77.

Ordinary domestic sewage contains from 15 to 35 ppm. of nitrogen, 4 to 6 ppm. of phosphoric acid, and 10 to 20 ppm. of potash.

(c) Manures from Agricultural and Animal Wastes and Industrial Products. Apart from the above major manurial resources, there are certain agricultural animal and industrial wastes which could be usefully utilised for providing manure to the soil. Some of these wastes and products are ; (i) rice bran, non-edible minor oilseeds, tobacco wastes and tobacco seeds, bagasse, marine algae, fruit and vegetable processing industry wastes, lac waste; (ii) and by-products from slaughter houses and dead animals, fishery wastes ; (iii) blast furnace slag, by-products of coal carbonisation, salt, bitterns, coal ash and mica waste.

1. Animal Wastes from Slaughter Houses. These are rich sources of nitrogen, phosphorus, calcium and other major and micro elements. The minimum annual mortality of large animals has been estimated at 8%. The consumable portion of animals present 30.50% of the total body weight, while the remaining portion consisting of blood, bones, liver, stomach, intestines, offal, hoof and hair forms waste material.¹

Keeping in view the large availability of organic wastes, the following groups of meal manures from the above animal wastes by chemical processing have been prepared :²

1. *Survey and Utilization of Agricultural and Industrial By Products and Wastes*, Committee on Natural Resources, Planning Commission.

2. *Khadi Gramodhyod*, vol xxi. No. 6, March 1975, p. 276.

<i>Manure</i>	<i>E</i>	P_2O_5	K_2O
Blood meal	10-12	1-2.6	0.8
Meat meal	10.5	2.5	0.3
Bone meal	1-2	22.0	--
Horns, Hoof meal	10-15	1.0	lime
Leather meal	7-8	0.1	0.2

(i) **The dried blood**, from slaughter house, contains 10 to 12% nitrogen. It may be used as a fertiliser by reducing it to fine powder form. This process consists in adding 1 to 3% of quicklime, which converts it into a solid cake which may be dried in the air without purifying and finally gives a fine and inodorous powder. Blood meal is now being used in Tamilnadu, W. Bengal, U. P., Maharashtra and Andhra Pradesh. Tea and coffee plantations use this manure.

(ii) **Horn turnings and shavings**. These contain 10 to 15 per cent of nitrogen. So these may be used as manure. But they are generally mixed with wood shavings and other sweepings of the workshops reducing its manurial value. Hoofs are, however, richer in nitrogen 11 to 15% than ground horn. Hair, wood, wool rags, old felt, and feathers have the same value as horn. In the pure state they contain 11 to 23 per cent of nitrogen. To serve as manure all those materials and particularly horn are reduced to a fine powder.

(iii) **Bone-meal**. Bones contain from 45 to 55% of phosphates chiefly as tricalcium phosphate and partly also in the form of magnesium phosphate. Bones containing 3 1/2 to 4 1/2 per cent of nitrogen, 3 per cent of calcium carbonate and 4 per cent of other ash (including silica) may be regarded as the light manure. Bone-meal as a manure is suitable for all types of soils particularly acidic soils where superphosphates cannot be used. It helps to increase the phosphorus content of grain and they enhance its nutritive value.

Bones of dead animals and bone-meal are little used in the country because of the ignorance and the age-long prejudice of the people, the absence of accurate information with regard to the use of the bones as manure in relation to different types of soil, and the difficulty of collecting and keeping the bones and of pounding them to powder. At present about 40% of bones were being collected and it might be possible to increase the collection to 70 to 75% of the potential availability of about 36 lakh tons of bones. So far about 400 bone digesters and 120 crushing units had been set up.

The supply of bones can be increased with the adoption of these measures: *First*, intensive salvaging of bones particularly from forests of U. P., Orissa, and Assam should be undertaken since considerable quantity of bones of cattle and wild animals remain abandoned in these states. *Second*, organised efforts should be made for the collection of bones at the village level. Such work

can be advantageously organised by the existing machinery in the rural areas and rural slaying centres. *Third*, all dead animals in the villages should be disposed of at a fixed place. Purchasing depots in the Block Development areas could perhaps be set up where the bones collected from the neighbourhood could be sold against cash at a reasonable rate.

(iv) **Fish Manures.** The by-products of fishing are important sources of fish manure and guanos which are both nitrogenous and phosphoric in their constitution. Fish guano is simply dried fish. It contains about $1\frac{1}{2}$ per cent of nitrogen and 1 per cent phosphoric acid. It has been used with success as a manure for root and cereal crops. It is made on a considerable scale from various kinds of fish refuse like dried fish unfit for human consumption, fish guanos, the cake left after pressing the fish oil and pitted fish and often other refuse from fish-curing yards. In making guano generally oil fishes like cod, herrings, sparts, etc., are boiled and pressed for the sake of their oil and the residue is dried, powdered, and sold as fish guano. In India out of a total of 32 lakh tonnes of fish production, only about 3 lakh tonnes are converted into manure. Potentialities offer for further development of fish manure from spoiled fish, small shell fish, lobster, crab and inedible fish. This industry could be attached to fish processing plant like curing where guts and gills form the waste materials, canning where tails, head and viscera are waste products and freezing. These materials roughly comprise 15–20% of fish weight. Fish meal contain 4 to 10% N., 3 to 9% P_2O_5 and 1 to 2% K_2O . It can be utilised for rice, coconut and many types of vegetables and fruit trees.

(v) **Poultry Litter.** is a rich organic manure since both liquid and solid wastes are excreted together running into as urine loss. It ferments very quickly and hence can be applied directly. About 40 adult birds produce nearly one tonne of manure a year⁶.

2. **Human Waste** Human excreta or night-soil is another source of organic manure.³² Calculated at the rate of 1.8kg. of nitrogen which night soil expelled from the body of one person on the average, produced in year, 55 crores of people produce 2.55 million tons of nitrogen; 1.1 m. tons of phosphoric manure and 0.7 m. tonnes of potash. It has an approximate composition of 0.7% nitrogen, 0.3% phosphoric acid and 0.2% potash.² But we

1. A. C. Garg, M. A. Indnani and T. P. Abraham "Organic Manure," *I. C. A. R. Technical Bulletin*, 1971.

2. The Chinese regard night-soil as property to be cherished rather than as waste material which may be thrown away. Jossua De Castro comments on this trait of the Chinese thus: "The dependence of the Chinese people on human wastes is so complete that along the roads in certain remote parts of the country the traveller finds special pavilions where suggestive, poetical inscriptions invite him to rest awhile, and leave his small, personal contribution of organic matter in the receptacle provided for the sake of regional soil. The same traveller may be amazed as he approaches the cities to see the belts of greenery that girdle them."—*Geography of Hunger*, p. 137.

1. Arakeri, H. R., and c ³p. *Cit.*, p 85.

are doing practically nothing to conserve and use this source of nitrogen supply due to prejudices. It can be easily used either in the form of poudrette or be converted into a form which is less obnoxious by the adoption of activated sludge process. This process reduces sewage, by the passage of air through it, a product which can either be used and required in the form of effluent from sewage tanks or dried and sent where there is a demand for it. The activated sludge process is suitable only for towns which have a sewage system. It is much more expensive than conversion into poudrette but has the advantage of conserving a large percentage of nitrogen. The Planning Commission recommends to devise suitable latrines in rural areas so that excreta could be collected and used as manures.

The quantity of human excreta can be increased for use as manure by providing more conservancy arrangement in rural areas. The main measures to be adopted are : (a) a sense of conservation of human wastes among villagers through propaganda and education; and (b) incentives to panchayats to prepare and distribute maximum quantity of night soil compost of good quality.

3. Other Wastes (a) **Oilseed Cakes**—Oil seeds and oil-cakes are another important source of manures, particularly the latter. If the cattle in India were fed with oil-cakes, the manure would be returned to the soil, whose fertility might thus be conserved. Oilcakes are generally used as cattle food but some of them, for various reasons, are unsuitable for this purpose. These oil-cakes as well as damaged cakes are employed as fertilizers. They have been applied considerably in top manuring and for general use on light soils when a slower-acting fertiliser is prepared. They usually contain 3 to well over 9% of nitrogen, 1.3% phosphoric acid, and 1.2% potash. The principal oil cakes used are groundnut, sesamum *neem*, *mahua*, *castor*, rape, mustard, cottonseed, linseed and *karanj*. *Neem* cake is a valuable material to act as a nitrification retarder and slow release nitrogen fertilised for rice crop, to control root knol and also plant parasitic nematodes.

(b) **Farm weeds**. Many weeds are highly selective in the absorption of certain ions and are richer in major and minor elements. These nutrient-rich plant materials can be composted before flowering and used as manure.¹

(c) **Water Hyacinth**. This is said to be twice as rich as town compost and four times as rich as farm manure. It is suitable for jute and rice fields, vegetable gardening and fruit growing.²

(d) **Forest Litter**. About 15 million tonnes of litter can be composted without in anyway adversely affecting the natural regeneration of forests.

1. G.C. Shukla and O. P. Vimal in *Indian Journal of Agricultural Science* No. 39, 1967, p. 1967.

2. E. F. Watson, in *Indian Farming*, vol. 8. No. 1, 1947, p. 29.

(c) **Fruits and Vegetable wastes**, consisting of peels, stones, rags, crown, skin, pomace and shell can be used to produce thousand tonnes of bulky manures.

(f) **Others.** Other waste materials like coal and basic slag can also be used as manure. Besides supplying nutrients which they themselves contain, they help to fix atmospheric nitrogen and also release locked up phosphates of the soil.¹

4. **Green Manuring.** When farmyard manure is scarce, green manure is a suitable form in which to supply organic matter to the soil to keep up the supply of the humus. Green manuring can be practised under irrigation and assured rainfall condition where the moisture content in the soil is adequate and does not interfere with normal seasonal cropping.

In agriculture of most ancient civilisations like the Greek, Egyptian, Roman, Chinese and Indian, legumes have always formed an important part in the cropping system practised. The value of leguminous plants lies in their ability to fix the free nitrogen in atmosphere and accumulate it in their root nodules in appreciable quantities with the help of some useful micro organisms who live in symbiosis with the plants. Various leguminous crops add nitrogen to the soil from 40 to 140 lbs. per acre, depending on the soil, climatic conditions and trends of crops, the average being 80 lbs. "Every crop or gram, peas, lytharus, sunnhemp, green gram, red gram, horse gram, pigeon pea and clovers, etc., leaves more than 20 lbs. of N (equivalent to two tons of farm yard manure or 100 lbs. of ammonium sulphate). About 40 to 50 lbs. of N may be fixed by bean and clover crops."²

The efficiency of green manures compared to others will be apparent from the following figures worked out from the recorded field experiments in Tamil Nadu State.³

Manure	Efficiency compared to that of Green Manure 100
No Manure	30.0
Phosphate only	50.0
Nitrogen only	70.0
Nitrogen Phosphate	90.0
Green Manure	100.0
Green Manure Phosphate	120.0
Green Manure Nitrogen	133.0
Green Manure Nitrogen Phosphate	166.0

1. N. R. Dhar "Nitrogen Fixation and Land Fertility Improvement, *Indian Agriculturists*, Vol. I No. 2. pp. 6-18.

2. *Proceeding of the English Meeting of Crops and Soils Wink*, p. 230

"The leguminous crop adds to the soil almost as much fertilizers per acre as 50 to 1100 mds. of cowdung manure"—Charan Singh, *Op. Cit.*, p. 265

3. S. Y. Krishnaswamy, *Rural Problems of Madras*, p. 116,

Taking of cereal and other non-leguminous crops continuously from the land exhausts the fertility of the soil, for such crops remove large quantities of nitrogen and other food elements without returning any. Cereals have been rightly described by Shultz-Lupitz as "nitrogen consumer and leguminous crops as nitrogen accumulators." Legumes thus are a very useful plant species which instead of depleting the soil help in increasing its nitrogen contents while deep-going and fine roots increase the organic matter content of the soil and thus improve its physical properties.

"The use of green manure increases the water-holding capacity of the sandy soil, improves the tilth of clayey soils by opening it, increases the accretion, facilitates drainage and requires less water for crops. It creates crumb structure in soil which is most important from agricultural point of view. It increases the organic matter content of the available nitrogen in the soil. It reduces the loss of mineral nitrogen by leaching, decreases the alkalinity of the alkaline soil and it may concentrate nutrients likely to be deficient in the surface soil and leave them there in the readily available form."¹ "It also acts as catch crops, shade crops, cover crops and forage crops."²

The crops used for green manuring should possess these characteristics : rapid growth, succulence, abundant foliage and ability to grow well on poor soils.

The crops used for green manuring are of two types, viz, *leguminous* crops and *non-leguminous* crops. The former supply both nitrogen and organic matter, while the latter only organic matter. The method of green manuring consists in growing such special crops which are more or less of a herbaceous character and rapid growth and capable of forming a good cover on the ground in a short space of time like *senji*, *sebannia*, *beans*, lentils, groundnuts, berseem, pulses, sannhemp, *guar*, indigo, *methra*, *soyabean*, *khesari*, *cow-pea* or *dhaincha* either alone or intermixed with others for the purpose of digging or ploughing into the soil in a green state when they have reached a suitable height or before flowering. This method of enriching the soil is considered to be one of the most economical as well as efficacious, the fresh vegetable matter being returned to the soil with greater advantage than when it has been decomposed and much of its goodness has been lost in the process of rooting and fermentation.

Of the shrubs (like *Tephrosia Candida*) and tree whose leaves are used for green leaf manuring. Honge, Cassia, Siamia, *glyricidia*, *karanji*, and *arak* are the most popular.

1. Pandey and Verma, *Soil Fertility and Green Manuring in Rural India*, Aug., 1955, p. 316 ; also see Arakeri, H. R. and Others, *Op. Cit.*, pp. 94-96.

2. V. T. Subbaih Mudaliar, *Common Cultivated Crops of South India*, pp. 516-518.

Although rich in nitrogen, green manures also supply sufficient quantities of phosphoric acid and potash. Green manures and green leaves that contain the most nitrogen are: dhaincha, 3.5%, wild indigo leaves, 3.2%; and ferns 3.1%. Ranking lowest in nitrogen are: prickly pear 0.3% and miscellaneous weeds—0.8%. The plant containing the phosphate most is prickly pear with 1.2%. Those with the least phosphate : wild indigo plant,—0.2%, miscellaneous weeds and sea-weeds, with 0.3% each. Ranking highest in potash are sea-weeds and ferns, each with 3.0%, and glyricidia, 9.8%. Plants containing the least potash are miscellaneous weeds 0.2%, forest leaves, 0.4% and wild indigo plant, 0.6%.¹

Data regarding green matter available from the various green manure plants are given below:²

Materials	N	P ₂ O	K ₂ O
Dhaincha	3.5	0.6	1.2
Sunnhemp	2.3	0.5	1.8
Wild Indigo plant	1.8	0.2	0.6
Wild Indigo leaves	3.2	0.3	1.3
Indigo Refuge	1.8	0.4	0.3
Avari	2.0	0.7	1.0
Prickly pear	0.3	1.2	1.1
Forest leaves	1.2	0.6	0.4
Tea prunings	2.4	0.5	1.3
Green weeds	0.8	0.3	0.2
Sea weeds	1.1	0.3	3.0
Fern weeds	3.1	0.5	3.0
Redgram plant	2.8	0.5	2.0

Experiments conducted with leguminous green manures indicate that 50 to 80% of the nitrogen is returned in the succeeding crop. Its residual effect lasts for 2 to 3 years but with decreasing efficiency. The nitrogen of a green manure is said to be much more readily available to the succeeding crop than that of stable manure. The rate of nitrification is greater in soils on which a leguminous crop has grown. Increase in availability of other elements, improvement in physical structure of the soil, suppression of weeds, change in soil reaction, conservation of soil, and its nutrients, preservation of losses through leaching, etc., are other benefits accruing from green manuring.

It may be noted that areas receiving less than about 30" of average rainfall are not suited for green manure crops unless irrigation facilities are available. Secondly, the value of crops following the green manuring crop must pay for the cost of the green manuring.

1. Arakeri and others, *Op. Cit.*, p. 99.

2. *Ibid.*

A rotation of rice-sannhemp or rice *dhaincha* is common throughout India. Other crop rotations that include a green manuring crop are as follows :¹

- (1) Rice-sannhemp (most of India).
Rice-berseem clover (N. India).
Rice-dhaincha (most of India).
Rice-Indigo (S. E. India).
- (2) Wheat-ground-nut-sugarcane-green manure (Maharashtra and U. P.).
Wheat-green manure-sugarcane-fallow (U. P. and Bihar)
Wheat-cotton-green manure-sugarcane-green manure (Punjab and U. P.).
- (3) Maize-green manure (senji) cotton (Punjab).
- (4) Sugarcane-green manure-wheat-cotton (U. P.)
- (5) Cotto-sannhemp (Tamilnadu).
- (6) Potato-lupins (mountains of Tamilnadu State).

However, green manuring suffers from certain defects, e.g., (i) It cannot be used on the dry lands. A minimum of 75 cm. of rainfall or equivalent irrigation is basically needed.² (ii) In some cases green manuring has been found to be uneconomical. In fact, it has done in the heavy deltaic paddy fields. In many cases, growing of green manure crops has restricted the growth of subsequent crops, and generally 2 to 3 years were needed for the land to be recovered.³

(iii) In areas, where rainfall is high, i.e., from 200 cms to 255 cms, the growing of green manure crops has rather been found difficult.⁴

Additional possibilities exist for green manuring crops in the rotation but most farmers cannot sacrifice for this purpose land and water needed for food crops. The promotion of green manure plants that do not compete with crop plants for space and water deserves great emphasis in the immediate future.

In order to increase coverage under green manuring, it is necessary that a large number of demonstrations in the farmer's field should be undertaken. Preparation of detailed plans for the production of required seed, devising methods such as peripheral planting, inter-cropping with green manures, protecting green manure crops against damage by cattle are other measures that may be taken up with profit.

1. Arakeri and others, *Op. Cit* p. 99.

2. M.S. Shivaraman, *Potentialities of Green Manuring*, p. 7.

3. *Proceeding of the second meeting of the Crops and Soils wing of the Board of Agriculture and Animal Husbandry*, 1937, p. 13.

4. *Ibid.* p. 35.

The area under green manuring has increased from 8.4 m hectares in 1968-69, to 8.5 m. hectares in 1969-70, to 10. m. hectares in 1970-71 ; 11.5 m. hectares in 1973-74. In 1977-78 it covered only 6 m. hectares.

5. Rotation of Crops. This device is generally defined as "a more or less regularly recurrent succession of different crops on the same piece of land."¹ Soil fertility can also be regained by practising the rotation of crops. According to Leighty, "Crop rotation or the growing of different crops in recurring succession on the same land was recognised as advantageous by early agricultural scientists and was made the foundation of the improvement in agriculture which took place in England, in large parts of continental Europe, and in U. S. A. during the last part of the eighteenth and specially during the 19th century."² The benefits to be derived from the growing of leguminous crops in alternation with cereals were distinctly recognised by the ancient Romans and Greeks as well as by early Indians; and the benefits of growing inter-titled turnips or root crops in rotation with barley, clover and wheat were discovered about 1730 in England. The farmers of ancient Rome understood that crops following beans, peas and vetches were usually better than those following wheat or barely, but it was not until the last quarter of the 19th century that people learned that the legumes with the aid of associated bacteria have the power of feeding on the free nitrogen of the air while the non leguminous plants can draw only on the nitrogen supply stored in the soil. Experiments conducted at the Indian Agricultural Research Institute have shown that growing of a legume like *berseem* develops a stable type and high degree of soil fertility for the succeeding cereal crops and that higher yields of wheat could be obtained for 3 or 4 years than when wheat is grown continuously.

The effects of crop rotation on yields are manifold: (i) Rotation aids in controlling weeds and certain crop pests and diseases.³ (ii) It may render manure and chemical fertilisers more effective by increasing the soil supply of organic matter and different crops in themselves may exert beneficial effects on those which follow. (iii) It reduces soil erosion and increases fertility by different crops growing in the same patch of land so as to enable intake of plant food from different layers of soil.

Study of the long continued soil fertility experiments made both in England and America has disclosed the following facts about crop rotation in its relation to soil productivity.

(1) In general, crop rotation has been found to be practically 85% as effective as farmyard manure and complete commercial

1. M. S. V. Rama Rao, *Soil Conservation in India*, 1962, p. 106.

2. U. S. Department of Agriculture, *Year Book of Agriculture*, 1938, p. 406.

3. Experiments in U. S. A have shown that root-rot diseases of maize and wheat are less when they were in rotation with oats, linseed or soyabean.

fertilisers in maintaining the yields of wheat, corn and oats and about 90% as effective as these fertilisers in increasing the yields of these major crops.

(2) The favourable effects of crop rotation do not impair the benefits derived from the use of fertilisers, so that when these two farm practices are combined the one practice adds to the benefits of the other.

(3) In comparison with the effectiveness of manures and commercial fertilisers, the relative value of crop rotation is practically 20% higher on soils sufficiently applied with lime as compared with soils that are acid.

In view of these advantages offered by crop rotation, we must emphasise more on the system of practising crop rotation in India where farmyard manure is not available in full quantity as it is limited by the number of farm animals.

The following table shows the rotation of crops followed in India ¹

Important Crop Rotations

1 Two-year rotation	2 Three-year rotation
1. Rice Pulses.	1. Wheat/Maize/Sugarcane.
2. Jowar or Maize, Wheat or Gram.	2. Sugarcane/Wheat/Cotton.
3. Cotton or Jowar/Groundnut or Jowar.	3. Wheat,/Wheat/Toria.
	4. Rice/Sugarcane (plant, Sugarcane (Ratoon).
	5. Wheat/Maize, Sugarcane.

6. Mixed Cropping. Another way of regaining the lost fertility of the soil lies in the secret of mixed farming. Mixed cropping is the practice of sowing one main crop and one or two subsidiary crops together on the same land. The production of different crops in mixture depends upon the local soil and climate conditions. The system of mixed farming is practised widely in India and has been an important feature of all old agricultural civilisations. The reason why Indian soils have not lost their fertility completely may in part be due to this system of mixed cropping leguminous component helping to maintain soil fertility. Crop mixtures such as wheat, gram, barley, peas, jowar, cotton, etc., are prevalent cropping systems in India. Such mixed crops, in addition to maintaining soil fertility are a guard against total failure of harvest due to unfavourable seasons, particularly some produce is obtained from the small holdings obtaining in India. In mixed crops with different root habits the plant food is utilised to the best advantage and there is no competition. Mixtures also furnish protection to other crops, e.g., jowar protects cotton from hot winds in the Punjab. Besides maintaining

1. *Indian Agriculture in Brief*, 1976, p. 66,

the soil fertility, mixed cropping also enables the farmer to get not only an adequate supply of cattle-dung and urine but to grow food crops in proper combination with other products which enrich the soil. The I. C. A. R. made successful experiments in U. P. and M. P. They showed that the yield was greater, money income increased substantially, and the cultivator had a better diet. Mixed cropping is specially suited for the dry farming areas where the main problem is to collect, preserve and use all the moisture available.

Sowing of a mixed crop is done by special seed drills. The mixed crop may be grown with three lines of the main crop and one line of the alternate crop or five lines by one line.

The following table shows important crop mixtures followed in India :

Important Crop Mixtures

State	Crop Mixture	
Maharashtra/ Gujarat	Rice and Jowar	Rice and Cotton
	Cotton and Jowar	Jowar and Tur
	Wheat and Linseed	Cotton and Tur
	Bajra and Tur	Groundnut and Cotton
Madhya Pradesh Punjab/Haryana	Wheat and Gram	Wheat and Linseed
	Linseed and Gram	Tur and Cotton
	Wheat and Gram	Barley and Gram
	Wheat and Barley	Jowar and Guar
	Chari and Moth	Maize and Senji
	Sarson and Wheat	Toria and Gram
	Til and Cotton	Moth and Cotton
	Melons and Cotton	Senji and Cotton
Uttar Pradesh	Wheat and Barley	Wheat and Gram
	Barley and Gram	Wheat and Mustard
	Jowar and Arhar	Maize and Urad
	Cotton and Arhar	Bajra and Arhar
	Bajra and Peas	
West Bengal (Wheat growing tracts, Andhra Pradesh	Wheat and Gram	Wheat and Linseed
	Jowar and Moong	Jowar and Urad
Rajasthan	Jowar and Moth	Tur and Cotton
	Wheat and Mustard	Wheat and Mustard
	Gram and Mustard	Wheat and Barley
	Wheat and Gram	Wheat and Mustard
	Gram and Mustard	Wheat and Barley

Thus, it will be gathered that the important crop mixtures adopted in different parts of India are :—

(a) Rice + cotton + red grams.

(b) Jowar + black gram + green gram + horse gram with ground-

nut or fibres like *Hibiscus Cannabinus*.

- (c) Bajra + mesta + sannhemp + groundnut + pulses.
- (d) Ragi + niger + red gram + cow pea + jowar.
- (e) Wheat + gram + safflower + mustard.
- (f) Cotton + groundnut + pulses.

CHEMICAL FERTILIZERS

An important factor that has contributed to the increase in agricultural production in the U.S.A. and the continent of Europe is the introduction of synthetic fertilisers. The fixation of atmospheric nitrogen as a result of scientific and engineering advances has brought about a tremendous change in the last 30 to 40 years in the relative importance of nitrogen sources dependent upon chemical production. But recently criticism has been levelled against its effect. Their continuous and sole application has deleterious effects on the soil due to various causes. The classical researches of Colonel McCarrison and B. V. Nath in India and those of Mackeridge and Bottomley in Europe and Clarke and Roller in America, have conclusively proved that crops raised with the organic manure, are pre-eminently superior in their nutritive value to those raised with artificial fertilizers, and seeds produced from the field, treated with organic manure possess greater germination power than those obtained from lands manured with artificial fertilisers. Improving the texture and water-holding capacity of the soil and providing food for the innumerable and invisible organisms inhabiting the soil are the benefits which organic manure confers on plant growth. In addition to these indirect advantages, organic manures appear to give plants a better balanced nutrition and provide certain nutritive factors, which chemical fertilizers either do not supply or supply only imperfectly. The application of chemical fertilisers, should, therefore, be supplemental to bulky organic manures like green manure or cattle manure.

Types of Fertilizers

Chemical fertilizers are usually of three types, viz., nitrogenous fertilizers, the phosphatic fertilizers and the potassic fertilizers.

Nitrogenous fertilizers, comprise saltpetre, nitre, ammonium sulphate, sodium, nitrate, and urea etc. Nitrogen influences crop growth in many ways e.g., it encourages the development of foliage; imparts a green colour to leaves; in case of cereals, it tends to produce lumpiness in seeds and it tends to produce succulence or tenderness in the plant. But if used in large quantities, nitrogen may prove harmful to the crop for it may lower its quality: it may delay maturity; it may decrease resistance to disease, and it may weaken the stems and cause lodging in cereals.¹

1. C. P. Dutt and B. M. Pugh, *Crop Production In India*, p. 123.

Phosphatic fertilizers are given to soil in the shape of phosphorus which is derived from various sources like bones and rock phosphates. When powdered rock phosphate is applied to the soil, phosphoric acid becomes readily available. Phosphorus helps the growth of plant in many ways e.g., it hastens maturity of crop; it encourages root development; decreases the ratio of straw to grain in cereals it strengthens stems, and reduces the tendency to lodge in cereals; it increases resistance to disease and it improves the quality of crops. Phosphorus balances or off-sets the harmful effects of excessive nitrogen and even if it is applied in excessive quantities it produces no bad effect on the crop.¹

Potassic fertilizers are given to the soil in the form of potassium chloride and potassium sulphate. These fertilizers help the transference of food materials from one part of the plant to another; they provide the needed green colour to the leaves; they tend to increase plumpness in grains and they tend to have a balancing effect between the first two types of fertilizers. Its presence in large quantities in the soil produces no detrimental effect on the crop.²

A Comparative Performance of Artificial and Organic Manures.³

Crops	Artificial			Organic		Organic & Mixed	
	N	P ₂ O ₅	NP	Cakes	F.Y.M.	Green	Mixed manuring
(1) Average response for lb. of plant nutrient							
Paddy	15.4	13.0	32.0	14.4	13.2	15.9	21.8
Wheat	7.3	5.1	14.2	7.2	6.9	15.9	8.0
Sugar-cane	102.4	56.0	107.5	172.0	67.6	15.9	276.8
Cotton	6.8	0.9	10.8	4.2	6.6	15.9	6.8
Pulses	Negative	7.7	12.8	6.4	8.6	15.9	—
Oilseeds	6.9	8.8	13.3	9.5	3.0	15.9	—
(2) Percentage increase over no manure yields							
Paddy	23.2	20.4	30.0	47.3	39.9	31.5	10.3
Wheat	27.8	23.6	69.4	43.7	58.8	29.1	28.9
Sugar-cane	47.8	30.3	43.6	62.7	22.3	18.0	144.0
Cotton	27.2	19.2	54.4	39.6	41.5	15.5	98.5
Pulses	Negative	99.8	128.0	57.7	120.5	15.2	179.0
Oilseeds	49.4	19.0	44.0	47.9	39.9	—	48.1

1. C. P. Dutt and B. M. Pugh, *Ibid.*, p. 126.

2. *Ibid.*, p. 127.

3. *Report of the Expert Committee on Manures and Fertilizers.*

Time of Application

The time of application of fertilizer often makes a considerable difference in its utilization by the crop. Plants absorb large quantities of nitrogen, phosphoric acid, and potash during the early stage of growth. Therefore, the fertilizers should be applied to most crops at or before sowing time. Fertilizers need not be applied to annual crops in the latter stages of their growth. A late application of nitrogen to a crop increases the nitrogen content, prolongs the growing period and delays maturity. But crops of long duration, like sugarcane, require the application twice or thrice at suitable intervals. The phosphatic fertilizers should be applied a little before or at the time of planting the crop, as phosphorus is not leached out of the soil. Potash is applied at the time of planting and to a limited extent as a top-dressing a later stage of crop growth.

Response to Fertilizers

The response to fertilizers varies with the nature of the soil, the crop grown, and whether it is rain-fed or irrigated. Results of extensive trials conducted throughout India in cultivator's fields show that the "best response with nitrogen fertilizer on rice was obtained on old alluvial soils, with an increase of 859 lbs. of paddy over the control plot. In decreasing order the responses on the other soils were : black soil, red soil, red gravelly soil, and on a mixture of red and black soil. The least responses with nitrogen fertilizer on paddy was obtained on coastal alluvium, deltaic and saline soils, new alluvium and laterite. The increase in paddy yield over the control plot as a result of applying 30 lbs. of N was 514 lbs of grain. The respective yield in case of bajra was 155 lbs., ragi 412 lbs., wheat 289 lbs., per acre over the control plot.¹

Methods Used

The methods generally used applying fertilizers are :

- (i) Broadcasting during the preparation of the soil before planting.
- (ii) Placing in rows either before or at the time of planting.
- (iii) Side-dressing or top-dressing the crop during the growing season.
- (iv) Applying liquid fertilizers.

Considerations Governing use of Fertilizers

It may be stressed that in order to secure maximum response to fertilizers the crop should be irrigated immediately following their application and at suitable intervals thereafter, because the response

1. *Ibid.*, pp. 186-187.

of the crop under unirrigated conditions is usually uncertain and relatively small.

Secondly, the maximum profit from the use of fertilizers depends on such factors as nature of the soil, kinds of crop grown, climate, price of fertilizers, the market price of the produce, etc. All economic results.

Thirdly, the use of fertilizers is also subject to the Law of Diminishing Returns. This means that the rate of increase in crop yield decreases after a certain point is reached regarding the quantity of fertilizers used, and consequently the value of the additional yield annually becomes less than the cost of the fertilizers. Usually, the smaller applications of fertilizers produce greater percentage increases of yield than larger application.

Fourthly, it should also be noted that the adequate supply of nutrients is only one of the factors that determine crop yields and that the application of fertilizers is not the sole means of making good nutrient deficiencies in soils and plants. Equal attention must be paid to the other soil and crop management practices such as good tilth, proper drainage, required soil reaction, soil conservation, good land use, suitable crop rotation, adequate bulky organic manure in the soil and satisfactory soil micro-organism activity. Each one of these plays a vital role in determining eventual production. Neglect of one of these factors leads to reduction in yield and creates the need for still heavier manuring.

Finally, manuring should not only be balanced in itself, but should also be designed to supplement the good effects of proper land use and beneficial soil management.

The demand for fertilizers has been rapidly increasing in recent years but it has not been possible to meet it in full due to lack of internal production capacity and shortage of foreign exchange needed for imports. Therefore, the Fertilizer Distribution Committee has emphasised on the use of fertilizers in the form of mixture with a view to promoting balanced fertilization and making the best use of supplies of nitrogen fertilizers, improved arrangements for distribution and attention to quality, and reduction in costs of distribution.

As a result of extension efforts, there has been a steady increase in the use of chemical fertilizers. The total consumption of all types of fertilizers was 17.58 lakh tonnes in 1968-69. It increased from 19.83 lakh tonnes in 1969-70, to 22.56 lakh tonnes in 1970-71; and 28.40 lakh tonnes in 1973-74. It was 28.94 lakh tonnes in 1975-76 ; 34.11 lakh tonnes in 1976-77 and 40.84 lakh tonnes in 1977-78.

The consumption of different types of fertilizers has been like this.¹

Year	Nitrogenous	Phosphatic	Potassic (In lakh tonnes)	Total
1960-61	2.30	0.70	—	3.00
1965-66	6.00	1.32	0.90	8.28
1968-69	12.08	3.80	1.70	17.58
1969-70	13.56	4.18	2.09	18.83
1970-71	14.79	5.41	2.36	22.56
1971-72	17.98	5.58	3.00	26.56
1972-73	18.40	5.81	3.48	27.69
1973-74	18.29	6.50	3.60	28.39
1974-75	18.02	4.73	3.36	26.11
1975-76	21.49	4.67	2.78	28.94
1976-77	24.57	6.35	3.19	34.11
1977-78	28.88	8.27	4.69	41.84
(Estimated)				

It has been observed that the consumption of fertilizers was significantly low below what the Fourth Plan targetted. "This has been due to various factors, such as inadequacy of supplies resulting mainly from shortfall in indigenous fertilizer production and non-availability in international market : inadequate fertilizer promotion measures, lack of adequate credit facilities in several areas and insufficiency of retail points at convenient distance from the various rural areas."² During the Fifth Plan demonstrations and the other programmes were undertaken to increase the use of fertilizers. Substantial expansion of facilities of soil testing laboratories were set up. Distribution arrangements were also to be strengthened.

In order to stimulate the consumption of fertilizers, a ten-point programme has been circulated by the Ministry of Agriculture to the states. It comprises :

- (1) Massive demonstrations (200 in each district) on a package of approach for specific commodities like cotton, oilseeds, jute, cereals, sugarcane, fruits, vegetables and plantation crops.
- (2) Training of village workers, salesmen and farmers ;
- (3) Organisation of fertilizer festivals ;
- (4) Strengthening of the existing soil testing laboratories ;
- (5) Provision of increased credit facilities ;
- (6) Provision of credit in kind as fertilizers ;
- (7) Opening of more retail selling points in each block ;
- (8) Linking of commercial bank credit programme with fertilizers on an area basis.

1. *Draft Fifth Five Year Plan, Pt II, 1974, pp. 4 and 12; Indian Agriculture in Brief, 1976, p. 214, Report of the Ministry of Agriculture, 1977-78, p. 57.*
 2. *Draft Fifth Five Year Plan, 1974-79, Pt. II, p. 12.*

- (9) Provision of proper transporting and distribution of domestic and imported fertilizers.
- (10) Installation of mechanised and semi-mechanised equipment for handling of bulk fertilizers.

During the Draft Five Year Plan (1978-83), the fertilizer promotion policy will emphasise optimisation rather than maximisation of the dosage to enable extensive use at a lower dose to cover larger farming areas and farming population. An important objective of this policy will be to lessen spatial concentration and promote fertilizer consumption in areas of low growth including a large number of irrigated districts and in areas where the distribution network is weak and communication is inadequate. Special attention will be paid to making fertilizers available at reasonable prices and at proper time."¹

Conclusions

The secret of good farming is how to manure in order to raise the best crop at the lowest level of manuring. Most of the Indian soils suffer from deficiencies of nitrogen. Red, black and alluvial soils are deficient in nitrogen, phosphoric acid and humus, while laterite soils have sufficient humus and nitrogen. The deficiency of laterite soils is in potash, phosphoric acid and lime. Other three soils have sufficient potash and lime. These deficiencies can be made up by applying organic materials as well as the inorganic fertilizers.

Land is actually like a living being. It gives nourishment to crop and in return calls for nourishment. These inputs are water, manure, seed and human or cattle labour. Neither the soil conservation programmes alone, fertilizer alone, improved tillage alone can each give a small uneconomic increases on good soil but the combination commonly gives a three to six fold increase in harvest.

APPENDIX 1

Fertilizer Consumption During 1976-77 (000 tonnes)²

State	Nitrogen (N)	Phosphate (P)	Potash (K)	N+P+K
Andhra Pradesh	297.4	82.6	21.5	401.5
Assam	2.7	0.4	0.7	3.8
Bihar	128.3	18.1	9.5	156.9
Gujarat	135.2	53.9	13.3	202.4
Haryana	115.6	15.7	6.0	137.3
Karnataka	130.4	43.1	32.7	206.2
Kerala	33.5	15.7	20.1	69.3
M. P.	90.6	38.7	7.3	136.6

1. *Draft Five Year Plan*, 1978, p. 142.

2. *Indian Agriculture in Brief*, 1977, p. 220.

1	2	3	4	5
Maharashtra	192.8	59.0	38.2	290.0
Orissa	43.9	11.0	7.1	62.0
Punjab	256.7	93.6	20.7	371.0
Rajasthan	79.1	15.9	3.7	98.7
Tamil Nadu	184.1	42.1	51.4	277.6
U. P.	572.2	101.5	55.7	729.4
West Bengal	101.6	27.0	23.1	151.7
Total India ...	2457.1	635.3	318.6	3,411.0

APPENDIX 2

*Consumption of Fertilizer Per Unit of Cropped Area
1976-77 kg/hectare*

State	Nitrogen	Phosphate	Potash	Total
Andhra Pradesh	22.5	6.2	1.6	30.3
Assam	0.9	0.1	0.3	1.3
Bihar	11.9	1.7	0.9	14.5
Gujarat	13.4	5.3	1.3	20.0
Haryana	22.4	3.0	1.2	26.6
Karnataka	12.0	4.0	3.0	19.0
Kerala	11.2	5.2	6.7	23.1
M. P.	4.3	1.8	0.3	6.4
Maharashtra	9.9	3.0	2.0	14.9
Orissa	6.0	1.5	1.0	8.5
Punjab	42.7	15.5	3.4	61.6
Rajasthan	4.4	0.9	0.2	5.5
Tamil Nadu	24.1	5.5	6.7	36.3
U. P.	24.9	4.4	2.4	31.7
W. Bengal	13.6	3.6	3.2	20.4
Total India ...	14.5	3.7	1.9	20.1

11.

Improved Seeds and Plant Protection Measures

Improved Seeds

Of all the methods of improving agricultural technique none has brought about such progress as the improvement of plants through selection and cross-breeding. These methods of improvement entail considerable expense and constant care, whereas the use of improved varieties of seeds only involves the agriculturist in the slight extra expense represented by the surcharge of a few rupees per capita of seeds. The introduction of a better variety in an agricultural area means an immediate profit for the agriculturist. It improves the crop either in quantity or in quality while scarcely increasing the cost of cultivation. The creation of variety with an improved yield and quality is, therefore, one of the simplest and most effective means of raising the general level of the country's economy.

The methods of producing better varieties include the introduction of new forms, selection from variations occurring in nature and from those artificially induced by hybridisation of plants and indeed all those means by which conscious improvements of plants may be accomplished. It has been estimated that an increase in the production of 10 to 15 per cent can be obtained from improved varieties.

Plant genetics is advanced enough to develop seeds strains almost to order. Nature's slow process of mutation has been speeded up by irradiation of seeds with radio isotopes and selecting strains with the desired qualities. Indian scientists have produced strains which are not only prolific yielders but also flood-resistant, draught-resistant and disease-resistant and which mature early. These are meeting the conditions of water logged areas, semi-arid tracts and the requirements of the multiple cropping.

Importance of Improved Seeds

Demonstrations have revealed that the natural average yield of rice was 1.15 tonnes per hectare in 1971-72, 85 per cent of the national demonstration plots with HYV seeds gave a yield exceeding 4.5 tonnes. The figures of wheat were 1.31 tonnes per hectare on

81 per cent of the plots in 1971-72. The analysis of the yield data reported from various states indicated that as compared to traditional varieties, the yield of these varieties was significantly higher. The higher yield of paddy touched the level of 13,000 kgs. per hectare (I R 8 in Karnataka) and the average yield in different states ranged between 2,100 Kgs. and 5,500 Kgs. per hectare. In the case of hybrids, yields as high as 7,835 Kgs., 7,500 Kgs. and 6,527 Kgs. per hectare were obtained for maize, jowar and bajra respectively. The per hectare yields of maize ranged between 1,404 Kgs and 3,500 Kgs. in different states and those of hybrid bajra ranged between 1,300 Kgs. and 3,875 Kgs., and of jowar between 1,275 Kgs. and 3,767 Kgs.

However, several administrative, organisational and institutional problems faced in the implementation of the programme of high yielding varieties were identified during the Evaluation Studies conducted by the Planning Commission and Agro-Economic Research Centres. The problems included provision of additional facilities in certain research laboratories, strengthening of soil testing facilities fuller utilization of available soil testing facilities, greater emphasis on demonstration and improvements in training programmes, better publicity, popularisation and use of treated seeds, quality control of fertilizers and pesticides and increased supply of institutional credit.

In spite of these problems, the coverage under high yielding varieties increased from 19 million hectares in 1966-67 to 14.0 million hectares in 1970-71, to 25 million hectares in 1973-74, 27 million hectares in 1974-75 : 32 m. hectares in 1975-76 and 33 m. hectares in 1976-77.¹

Some Improved Varieties

Quite a large number of improved varieties of foodgrains have been evolved, which have helped in boosting up the production of foodgrains. The All-India Co-ordinated Project on Improvement of Wheat has evolved new varieties which have a high degree of resistance to all types of rust and which mature earlier than the older varieties. Research work is being carried on at 20 centres. The varieties evolved are suitable for rainfed conditions, particularly in Central and western Regions of the country, comprising Punjab, Haryana, Rajasthan, M.P., U.P., North Bihar, Gujarat and Maharashtra. Most of the varieties ripen within 120 to 140 days and their yield potential varies from 20-25 quintals to as much as 70-80 quintals per hectare.

Based on field trials the following varieties of wheat have been considered suitable for rain fed as well as high fertility conditions. Larma Rajo, Sonara—64, Sharbati Sonara, Kalyan Sona, Sonalika, S—311 (Chotti Lerma), Safed Lerma, Hira (H.D-1941), Narmada-4c.

1. R. B. I., Report on Currency and Finance, 1976-77, p. 22.

Meghdoot (H I—7483). H. S. 1097—11, Moti, Pusa Lerma, U. P. 215, U. P. 310. H D—1925, H D—1982, H D—1999. H D 4502 and W. G.—377. Some of these are of short duration, while others are late sowing varieties and are grown where irrigation is available even up to the middle of January after the harvest of sugar-cane, potato, toria, radish, carrots or turnips.

Even more heartening are some of the exotic varieties of paddy which can stand high doses of fertilizers and give yields ranging from 3500 Kgs to 7500 Kgs per hectare. So far more than 400 superior varieties have been evolved, which give 10 to 20 per cent more yield. The All—India Co-ordinated Rice Improvement Project is involved in bringing out new varieties of dwarf and high yielding ability. Many of these varieties are of better grain quality, early maturing and drought resistant ; while others are susceptible to severe diseases (bacterial leaf blight) pests, (stem borers and leaf and plant hoppers) unsuitable under water-logged conditions, coarse glutinous grain and poor consumer acceptance. Therefore, now such varieties are being raised which are devoid of these problems.

The main varieties suitable for general cultivation are I R—8, Jaya, and Vijaya. Those suitable for specific regions are : Bala, Cauvery, Kandi, Krishna, Padma, Pankaj, and Jagganath. The varieties for special situation are Sabarmati, Jamuna, Ratna, and I R—20. Other six dwarf varieties for specific regions are : Hamsa, Annapurna, Karuna, Sarju—49 and Suma and Kusuma.

The All-India Co-ordinated Project on Pulse Crops was undertaken in 1967 with a view to evolve quick yielding varieties which can be fitted into suitable multiple cropping and relay-cropping patterns in areas with assured irrigation and also high yielding strains which are resistant to pests and diseases. The I A R I scientists have developed a new short duration (75 days) variety of green gram (viz, Pusa Baisabhi) for growing between rabi and kharif crops yielding over a tonne of grain per hectare.

About 7,000 varieties of chana (Bengal Gram) have been under trial at IARI. Besides, thousands of varieties of Arhar, moong and other pulses have been screened in the regional centres at Hyderabad, Coimbatore, Jabalpur, Ludhiana, Varanasi, etc.

Great possibilities are now open for increasing the yield of pulse crops, particularly during the Kharif season, through control of pests ; as will be clear from the following table :¹

1. M. S. Swaminathan, "New Farm Technology to Get Maximum Benefit" in Economic Times.

Crop	Yield Kg/ha Without Pest Control	With Pest Control
Mung (kharif)	560	1,160
Mung (Summer)	27	87
Pea (Rabi)	1,179	1,757
Gram (Rabi)	1,225	17,160

Under coarse grains, new varieties of maize, bajra, jowar and sorghum have been evolved under the programmes of the All-India Co-ordinated Millets Improvement Project. Six hybrids H B—1 to H B—4 of bajra and two others have been released which take about 75 days to mature and give yields of about 4000 Kgs. per hectare. But these strains are subject to pests and diseases and hence have not been very popular. However, efforts are on way to overcome these problems. Two hybrids—CSH I and CSH II—of Jowar have been evolved. These take about 3 to 4 months to mature and yield about 4000 to 6000 Kgs. per hectare. But these have not found much favour with the cultivators, because when they are about to mature rains deteriorate the quality of the grain ; and some of these hybrids are not suitable for high rainfall areas ; and they also do not meet the consumer demands.

Yields of Hybrid Sorghum are given below :

Yield of Hybrid Sorghum (Early and Medium duration Area)

Grain yield in kg. per hectare			Fodder yield in kg. per hectare			
CSH I	CSH II	Local Improved strain	CSH I	CSH II	Local Improved strain	
<hr/>						
Mean						
Performance in						
13 Trials	2562	1985	1567	4766	9262	8367
% over Local	164	127	100	57	111	100
<i>Yield of Hybrid Sorghum</i>			(Mid-late Areas)			
Mean						
Performance in						
13 Trials	3002	2465	1700	9741	6748	9938
% over Local	177	145	100	98	68	100

A number of high yielding hybrids and composite varieties of maize has been evolved under the All-India Co-ordinated Maize Breeding Project, such as the Ganga 101, Ganga—3, Ganga-Safed 2, Ranjit, Deccan, Himalayan-123 and Hi.Starch. These mature between 85 to 120 days and give about 45 to 75 quintals per hectare. They have been adopted in some areas like the northern plains,

southern Rajasthan, Gujarat and Maharashtra, and in some parts of Deccan, but in others there has been considerable resistance from the farmers because the available varieties do not fit in well with the existing pattern of rabi crops and, moreover, they are nonresistant to pests and diseases.

So far as oilseeds are concerned, high yielding and early maturing varieties have been for castor (Aruna CSH—2, Suphala), groundnut (M—13) C—148 and KG—61—120); rust-resistant varieties of linseed; and high yielding tall and dwarf hybrids of coconut. To meet the increasing requirements of edible oils in the country, large scale cultivation of soyabean is undertaken in Maharashtra, Gujarat U. P. and M. P. Sunflower is also being grown over large areas in the country particularly of the Russian variety, in Tamil Nadu, Maharashtra, Karnataka, Andhra Pradesh, Gujarat and some parts of North India. Demonstration schemes for castor summer-irrigated groundnut and implementation of aerial ground spraying of other oil seeds is also under way.

Superior strains of sugarcane have been evolved at Coimbatore, which are more vigorous and good yielders. Co 312, Co 313, Co 419, Co 421, Co 427, Co 527, Co 453, Co 8 and Bo 11 are important varieties. But because of low rate of multiplication of seed and tardiness in the adoption has been the main problem in their popularity.

A large number of improved types of *arboreum herbaceum* and *American varieties* have been evolved under the Central Cotton Committee such as the Kalyan, Vijaya Laxmi, Pratap, Virnar, Jarila Jayther, Garoni Uganda, K-2 K-5, N-14, C-1, C-12, F-216, F-231, R 420, Malwa 9, and Indore 1. But many new varieties have now been developed by IARI MCU—5 (*Sujata* and *Suvin*), Gujarat Hybrid 4; Varalakshmi, PR 9. PS 10 and SS 67 are not only short of duration, but also long-staple, superior cotton with high ginning capacity. These are being raised in the command areas of Rajasthan Canal, Tungbhadra and Nagarjunsagar.

Under fodder crops *Pusa Giant Napier* grass gives 2500 to 3000 quintals of green matter per hectare per year. It contains 25 per cent more protein and 12% more sugar than the Napier grass, *Pusa Giant Berseem* gives an additional 900 to 1000 quintals of green fodder per hectare per year, and is frost-resistant.

In the field of horticulture and vegetables, improved varieties giving good performances as regards yields and freedom from diseases have been evolved. Important among the vegetables are tomato, brinjal, bottle gourd, sweet potato, garden peas, field peas, cabbage, cauliflower, turnip, carrot, khol-khol, lady's finger and many others.

Among the fruits, the development of crops like nuts (almond and walnut) has been promoted in the Himalayan region. Grape

cultivation has been given a fillip in the Deccan and Peninsular India with a new promising variety *Anab-e-Shahi*. Another variety *Pusa Seedless* is now being cultivated in Delhi region.

Besides, many foreign vegetable crop varieties and fruit trees have been released for commercial cultivation. Important among these are high-yielding tomato and garden varieties from the U.S.A., Cowpea variety from the Philippines, pea varieties of water melons from the U. S. A. and Japan, and a pea variety from Australia.

Sugarbeat is also being cultivated efficiently in Punjab, Rajasthan, U. P., Haryana and in selected areas in Maharashtra.

Techniques of Obtaining High Yields

High yields are obtained from hybrid varieties through :

(a) *Thick sowing*, i.e. the plant density is increased e.g., the ideal plant population of maize, jowar and bajra are respectively 50,000¹, 140,000; and 120,000 plants per hectare.

(b) *Fertilizer dosages*, To reap rich harvest it is necessary to apply about 100 kgs. of nitrogen, 50 kgs. of phosphorus and 30 kgs. of potash per hectare. With increased yields elements like sulphur, zinc and boron get depleted. Therefore, in areas of intensive cropping, these are supplied as a routine procedure.

(c) *Pest and Disease Control*. For producing high yields plant protection measures are needed.

(d) *Proper Timing of Fertilizers and Irrigation*. Where heavy doses of fertilizers are being applied, it is important that 75 per cent of the dose of N should be given at the time of sowing. Irrigation at the time of grain development is essential.

Genetic Improvement of crops

Genetic improvement of crops and plants are of highest importance and urgency for several reasons, such as :¹

- (i) Large yield increases are dependent to a large extent on a suitable variety, which is capable to produce high yields, provided other associated factors are available in proper combination.
- (ii) Inter-actions and responsiveness of improved varieties with fertilizers, additional moistures and other inputs are substantial.
- (iii) Improved varieties are one of the most important components of strategic inputs, which farmers would like to use for attaining a higher yield.

Agricultural production can be increased further if efforts are made on putting the scientifically bred, processed and tested seed on

1. R. C. Dwivedi, *New Strategy of Agricultural Development in India*, 1972, pp. 35-36.

the land. This programme will necessarily involve efficient production of breeder, foundation and certified seeds, their processing, storage, quality control, and seed distribution and marketing.

The *production of breeder seeds* is determined by the moisture, sunlight, temperature patterns, susceptibility to disease and pests, drainage situation, and consumer preferences of every area. These dictate the optimality of the seed which can maximise yields for a particular area. The agencies for releasing breeders seed may be ICAR, agricultural universities or the private seed agencies.

Production of *foundation seeds* require that such seeds are inspected frequently in order to ensure a high yield with disease-free, well filled and viable seed grains. Harvesting, cleaning, bagging and labelling have to be carried on under expert supervision. Such seeds can be produced on seed farms of large size which enjoy adequate facilities and good technical staff for their production.

Certified seeds are produced with foundation seeds for use by farmers and which are certified as fulfilling prescribed purity, germination (namely 95 per cent) and other standards. Such seeds are generally produced in progressive farmer's farms under contract.

Seed multiplication programme requires that for multiplication of seeds, irrigated and fertile areas are chosen carefully, so that quality farmers seed can be produced without risk of disease and pests. *Secondly*, irrigation with large compact areas under production, good inputs, processing, storage facilities. *Finally*, adequate incentive should be maintained to spur the seed farmers to produce quality seeds.

Seed processing is concerned with extraction, drying, purifying treatment, packing and storage.

Regulation of quality seeds requires to be strictly adhered to. The objects of regulating the quality seeds are : to protect the farmer and the seed dealer against unscrupulous seed dealers ; to provide the farmers with standardised seeds, fulfilling certain requirements in respect of their varieties ; to test seeds for quality factors ; to restrict the export, import and inter-state movement of non-descriptive seeds.

The National Commission on Agriculture in its Interim Report on seeds of high yielding varieties and hybrids of cereals has dealt with certain aspects relating to multiplication and distribution of quality seeds of cereals with a view to ensuring regular supply of quality seed in adequate quantities. It has spelt out the responsibilities of various agencies in multiplication and distribution in different stages—breed's foundation and certified seed.

With regard to breeder's seed, it has laid down that responsibility should be on the research institutions and the Indian Council of Agricultural Research. For foundation seed, it has advocated that

the National Seeds Corporation should be responsible for varieties of all-India importance and State Governments should designate agency or agencies with regard to varieties of State importance.

With regard to certified seed, the Commission has advocated a multiplicity of agencies both for production and for marketing and has suggested their development by providing necessary incentives and facilities. The responsibility for assessment of the requirements of seed at various stages has been assigned to the production and marketing agencies subject to supervision, guidance and co-ordination by the State and Central Governments.

There are three large all-India Organisations for production of certified seeds, i.e., the National Seeds Corporation, the Terai Development Corporation, and the States Farm Corporation of India; besides two all India associations of private seed producers, i.e., All-India Crop Improvement and Seed Producers Association and All India Seed Growers, Merchants and Nurserymen Association. Some State governments have also their own seed corporations which manage their seed multiplication farms.

STATE FARMS CORPORATION

This Corporation was established in 1969 to supply quality seeds. It produced 2.35 lakh quintals of quality seeds in 1976-77 as against 1.91 lakh tonnes in 1975-76. The value of production was estimated at Rs. 8.04 crores and Rs. 6.94 crores respectively.

Two farms have been set up under its management, one in Kashipur (U.P.) and another in Kurnool (Andhra Pradesh). The former is about 1000 acres in extent while the latter is about 500 acres. These farms are completely mechanised and they specialise in the initial multiplication of breeder seeds and the production of foundation seeds.

NATIONAL SEEDS CORPORATION

This Corporation was established in 1963 mainly as an organisation to produce, stock and supply foundation seeds for hybrids particularly hybrid maize which were released by that year. The Corporation launched a major programme of seed production of certified seeds of hybrid maize, hybrid jowar, hybrid bajra and Tai-chung Native I in December, 1965 and January, 1966.

Seven Regional units have been set up in different parts of the country to the Corporation to facilitate timely supply of parent seeds, and to provide technical guidance and seed and inspection and certification of hybrid seed crops, 14 processing plants have also been set up to facilitate the processing of seeds. Each plant has a capacity of nearly 3,000 to 4,000 quintals per year. It has also popularised land levellers and planters by providing these on lease.

The Corporation has been providing besides hybrid seeds of maize, jowar, bajra, rice etc., vegetable seeds also, such as Pusa

Sawani *Bhindi*, Pusa Rubby tomato, Pusa Purple, Long brinjal, Pusa Katki, cauliflower, new Pusa Chillies, Guntur 3 chillies, Coimbatore long Karela, Bonnaville and Perfection New line peas and Asiriya Murtunde groundnut.

The NSC produced 30,755 quintals of foundation seeds and 7,11,693 quintals of certified seeds during 1975-76. Keeping in view the utmost importance of timely availability of seeds to farmers, the Corporation has established a network of 2090 seed dealers and 83 sales points all over the country by 1976-77. Its total turnover was Rs. 16.22 crores in 1974-75 and Rs. 22.24 crores in 1975-76. The Corporation has built a reserve of 612 tonnes of foundation seeds and 8,022 tonnes of certified seeds to meet unforeseen demands for seeds in 1977-78, as against 392 tonnes and 4,383 tonnes in 1976-77 and 204 tonnes and 2,570 tonnes in 1975-76.

The Terai Development Corporation, set up in 1969, has made appreciable progress in production of seeds particularly of paddy, maize, sorghum and soya beans.

Thirteen farms of large-size have already been set up during the Third and the Fourth Plan period and about 40 seed producer's co-operative societies are working.

During the Fifth Plan, special attention is to be devoted to multiplication and distribution of improved seeds. The main components of the programme will be continuous supply of breeder stock, adequate arrangements for production of improved seeds, arrangements for seed processing and storage and seed certification.

In brief, the essential measures needed to fulfil the gap between the requirements and available supply of high yielding seeds, are four :

- (a) Production of quality-seeds, their proper use, popularising them and making suitable arrangements for their distribution;
- (b) Enabling the poor farmer to purchase them, through such facilities as credit ;
- (c) Making available supporting inputs like water and fertilisers so that seeds could be used efficiently ; and
- (d) Greater provision of research in evolving better seeds, suiting Indian conditions

PLANT PROTECTION MEASURES

Magnitude of Losses due to plant Pests and Diseases

In India, crops are damaged not only by insect pests and diseases of crops but also by wild animals and natural calamities. Various estimates have been made about the losses suffered from insects, nematodes, fungi, bacteria, viruses, parasites, weeds, rodents and other animal like birds, snails and snugs. One estimate puts the loss at

15%, amounting to about Rs. 4500 million per annum.¹ According to an estimate made recently by the Pesticides Association of India, on an average 18% of the crop is lost due to pest attack. In 1973-74, the provisional estimate of gross national product value of agriculture was Rs. 26,900 crores, and on the basis of 18% loss through pests, the total farm production loss worked out to Rs. 5000 crores. Though colossal, the loss is avoidable.²

Besides, rodents also cause an enormous loss during pre and post-harvest periods when the crop is still in the field. There are about 2400 million rats in India, and it has been estimated that 20 rats could consume the quantity of food sufficient for one person. On a gross estimate this means that rats are responsible for the spoilage of at least one-fifth of the grain produced. On the basis of consumption of 1 tonne of grain by rats per year the total consumption by the entire rat community comes to about 24 m. tonnes. In terms of money, this would come to about Rs. 18,000 million, when calculated at the rate of Rs. 750 per tonne.

Besides animal pests and animals like elephant, wild boar, jackals, locusts, monkeys, crows, stray cattle, porcupines, flying foxes, rabbits, parakeets, parrots, sparrows, and goats also damage standing crops to a large extent.

Diseases of crops also are very dreadful as they bring about deterioration of quality as well as quantity of agricultural produce after harvest, in storage, transit and even at different stages of consumption. It has been estimated that produce worth Rs. 4500 million is damaged due to these diseases.

The losses thus caused are very heavy and can be prevented through various plant protection measures. Plant protection measures are needed for the following reasons.⁴

(i) Efforts to increase the yield with the application of fertilizers, adoption of other improved techniques, provision for irrigation may not bear fruit if the crops are exposed to the ravages of pests and diseases.

(ii) If plant protection measures are adopted, the entire food deficit can be made good in due course of time.

(iii) In view of the high yielding varieties programme, the plant protection has become more urgent and necessary as some of the varieties are relatively more susceptible to pests and diseases. The application of higher doses of fertilizers promotes negative growth and increases vulnerability of these for the attack of pests and diseases.

1. Khadi Gramodhyog, XIII No. 1, 1966, p. 81.

2. Economic Times, 1975.

3. Khadi Gramodhyog, Vol. XIII, No. 1, 1966, p. 82.

4. R. C. Dwivedi, *Op. Cit.*, p. 99.

Objectives of Plant Protection Measures

The objectives of plant protection measures are two fold. *Long term objectives* comprise of evolving and strengthening, extension, quarantine, production, quality control and marketing of pesticides, equipment and air-craft in order to optimise to protection of plants, and produce and to minimise the net loss. *Short term objectives* are concerned with preventing of pests and diseases or fighting them with the cooperative endeavours of the farmers and scientists.¹

Plant protection measures, therefore, relate to protection of crops : (a) against seed-borne bacterial or fungal diseases through treatment of seed before sowing (fungicides) ; (b) against soil and surface insects through protective and curative spraying of pesticides (and nematocides or soil fumigants) through biological, cultural or other means ; (c) against weeds, through manual weeding or application of weedicides and herbicides ; (d) against rodents and non-insect pests through mechanical and chemical means (rodenticides) ; (e) against snails and slugs by using molluscicides.²

Causes of Plant Diseases

Diseases in plants are mainly caused by fungi, bacteria, virus and the deficiency of essential foods. Such diseases produce wilting, stunting, drying up, and malformation of parts like roots, stems, branches, flowers, leaves and fruits. Fungi attack not only the plant during its growth but also the produce after harvest, during storage and process. High humidity and warm climate help growth of fungi. They spread through air current. Bacteria and virus multiply themselves very fast. Viruses are transmitted from plant to plant through minute sucking insects (called aphids), through nematodes in the roots and certain other insects, and they act like poison.

Diseases caused by fungi and bacteria can be to a great extent prevented by prophylactic treatment with fungicides and bactericides, virus diseases, can be controlled by use of virus-resistants, strains, avoidance and destruction of infected seeds, better insect and nematode control and other measures.

Plant Protection Measures

The plant protection measures may be broadly classified as :

(1) *Chemical control*, which consists in spraying and dusting the plant by chemicals and poisons or mixing these into soil to kill pests and diseases which inhabit the soil. Some of the important chemicals used for pest control are (a) *pesticides*-comprising of *chlorinated hydrocarbons* and *Organ-Phosphorus Insecticides* (like DDT, BHC, Aldrin, Dieldrin, Endrin, Chlordane and Endosulfan

1. P. V. Shenoi, *Agricultural Development in India*, 1975, p. 252.

2. *Ibid.*, pp. 259-60.

phosphates, etc.) ; (b) *fungicides* (zinc Ethylene, discarborimide, copper oxychloride, Colloidal sulphur, Manganese Ethylene, Karathene, Phenyl, mercury acetate, Captan, Thiram. etc.); (c) *Weedicides* DNOC, PCP, MCPA, Ambean, Atrazine, Bromacil, Propánil, and prefix Ioxnil) ; (d) *Rodenticides* (zinc phosphide, Calcium, and sodium cyanamide, barium, carbonate, fumarin, warfin, etc.) ; (e) *Nematocides* (DD soil fumigant sodium, nemagon, and metham sodium) ; and (f) *Fumigants* (like EDCT, ethylene dibromide, aluminium phosphide and sodium cyanide, etc.)

(2) *Mechanical Control* includes eradication of the field rats mechanically, through traps, or fumigation of burrows in buildings, poisoned baits and use of rat repellants ; scaring away birds, monkeys and other animals ; collection of eggs of insects and pests and burning them ; and destruction of young shoot of plants and the infested parts.

(3) *Physical Control* measures include the application of radiation, and manipulation of temperature, humidity, etc; fruit fly rot fungus can be prevented in dry fruits and vegetables through cold storage.

(4) *Cultural Control* includes proper rotating crops, spacing of plants, ploughing, irrigating land at appropriate time ; and late sowing of crops.

The removal of all stubble after harvest of paddy, sugarcane, cholam or cotton will prevent bores resting in them and attacking the subsequent crop. Many pests feed on weed and grass when their food plants are not in the fields. Army worm, ricebug, paddy mealbug are examples of such pests. Periodical weeding of the fields would obviously keep down the severity of attack from such pests. The depths to which the soil must be ploughed to exterminate these weed varies ; the average appears to be about 10 to 11 inches, though in some areas it is as much as 15 inches. This may be done by means of tractors. Investigation should be directed into the eradication of waterhyacinth to noxious weeds which seriously interfere with the cultivation of land. Portions of dead trees of plants should be removed immediately.

(5) *Biological Control* includes control of pests by introducing their natural enemies like parasites and predators.

The Central Government created in 1947 a Plant Protection Quarantine and Storage Organisation to help in saving crops which destroyed by insects, pests and plant diseases. The functions of this Organisation are to control the plant diseases and flying pests like locusts, to advise and organise plant protection service, to provide personnel and medicines to enable the State to keep up their struggle for agricultural improvements, to prevent the import of foreign diseases and pests, to act as an inter-state exchange for information

on plant diseases and to organise research on discovery of parasites and pests living on undesirable plant pests.

(6) *Legislative Control* includes enactment of legislation to force the farmers to adopt plant protection measures when attack is detected in a particular case.

Finally, there should be developed a strong organisational net work at state, district and block levels for effective plant protection efforts. These primarily include issue of timely warning about impending epidemic of pests and diseases, demonstration of scientific use of chemicals, organising surveys of pests and diseases, continuous liaison with research and experimental stations, popularisation of prophylactic treatment and other plant protection techniques and training of farmers and keeping application equipment in working conditions.

Progress of the Programme

Plant protection programme benefited 16.6 m. hectares in 1965-66 and 48.0 m. hectares in 1970-71. It covered 60.5 m. hectares in 1973-74, and 74.64 m. hectares in 1977-78. The consumption of pesticides was estimated to be at 45,000 tonnes in 1973-74 44,509 tonnes in 1975-76 ; 49.874 tonnes in 1976-77 ; and 60,000 tonnes in 1977-78.

Prophylactic measures are being undertaken on a large scale. Under the centrally sponsored Endemic Area Scheme, an area of 8.86 lakh hectares was sprayed aerially and groundwise in 1976-77 as against 4.7 lakh hectares in 1975-76.

CROP INSURANCE

Practically every year, one part of the country or the other food crops are affected by weather hazards. Even though such natural hazards have been familiar to Indian agriculture, the widespread droughts, floods, fire, windstorms, hails or frosts and diseases of plants in the past have dealt a severe blow to the economy, inspite of various institutional and organizational measures, undertaken during the last 15 years. Crop yield instability is the normal condition and agriculture continues still to be "a gamble in rains". The magnitude of risks and the uncertainties to which the farmers fortunes are exposed, is very large. In fact, good years and bad years, wet weather and drought or floods, cold waves and frost, low yields and bumper crops are to be expected in mixed succession. The total loss due to natural calamities (like flood, drought and plant diseases) is estimated as high as Rs. 1,000 crores every year. The farmer behind the plough has to be assured that he will be compensated for such loss in crops. Otherwise, he cannot be drawn into the campaign to increase productivity of land under his plough.

Need of Crop Insurance

The need for protecting the farmer from natural calamities arises for the following reasons :

- (i) In India mother Nature has always been moody and temperamental. She is unpredictably generous to one State and disconcertingly bad-tempered to another. This fickleness of weather conditions in different parts of the country upsets the whole agricultural economy, and makes one part bountiful, while the other starves.
- (ii) Besides droughts and floods, locusts, hailstorms, frosts, fires, plagues and plant diseases have always been a serious enemy to agricultural industry by destroying standing crops and thereby reducing the producers' income.
- (iii) Majority of the holdings are small, from which the cultivators get marginal surplus in good years and incur heavy deficits in bad ones.
- (iv) Farming is more hazardous than any other form of enterprise. The weather can make all the difference between success and failure. Consequently, many farmers, particularly the small ones, fight shy of adopting new techniques. The fear of loss is so overwhelming that even when convinced of the gain accruing from the application of science and technology, they prefer to go along the beaten track of low productivity. Once freed from fear by crop insurance they can quicken the pace to high productivity.

The Fourth Five Year Plan observed, "Severe distress is caused to the farmers by crop failure resulting from drought, floods and other natural calamities. This risk is likely to get accentuated under conditions of large investments in fertilizers, pesticides, improved seed and other inputs which are proposed to be used on a large scale during the Fourth Plan. One of the important means of alleviating distress arising out from natural calamities could be the organisation of crop insurance."

The advantages of crop insurance are recognised on all hands such as :

- (i) It provides protection to farmers against losses caused by crop failure and thereby ensures stability in farm income : increases their credit worthiness from the point of view of institutional credit, and relieves them from the clutches of the moneylenders.
- (ii) In high-risk areas, because of crop insurance, cultivators may be induced to cultivate land which otherwise they would not have cultivated. By protecting the economic interest of the farmers against possible risk of loss, it accelerates the adoption of improved agricultural techniques.
- (iii) Economic stability of the farmers improves the farming productivity. According to Dr. P.K. Ray, "Insuree gives farmers greater confidence in venturing upon the adoption of new and

improved farming practices and in making greater investment in agriculture for improving crop yields and increasing agricultural production.”

(iv) Crop losses are spread over space and time. Losses suffered by farmers in certain localities are borne by many scattered over wide areas. The burden of loss, therefore, does not fall upon the poor cultivators alone.

(v) It reduces to a great extent, government expenditure relief measures extended to meet the havoc caused by natural calamities.

(vi) It strengthens the position of cooperatives and other credit institutions that finance agriculture to the extent it enables the farmer members to repay their loans in years of crop failure.

(vii) The payment of premium in time encourages a habit of thrift and self help among the farmers.

Observes Dr. Ray, “The chief merits of insurance as compared to relief and concessions, are that insured farmers in cases of losses can claim indemnities as a matter of right. Second, what is of greater significance, the losses are shared wholly or partly (where the Government undertakes to pay part of losses) by the farmers themselves”.

Speaking of the many advantages flowing from the crop insurance, an official of the U.S. Federal Crop Insurance Corporation said that it is fundamentally for the purpose of creating catastrophic insurance and is intended to ensure a minimum return to the farmer which enables him to stay in business in case of severe loss... .. The justification for the Government insurance is not alone the need of protection of the individual farmer and his continued income and buying power. This affects vitally labour, industry, trade, banking and the entire community of which the farmer is a part.

In the words of Shri S.K. Patil, “*Crop insurance is the Magna Carta of the Indian agriculturists*. It will mitigate rural poverty and will change the psychology of the Indian farmer in a radical manner.”

Nature of Crop Insurance

Crop insurance indemnifies loss or damage to growing crops resulting from a variety of causes such as hail or drought, frost, flood fire and disease. The farmers pay a premium and protection is given to them on the same basis as in other insurance. When the production from an insured acreage falls below the insured coverage, the farmer is entitled to an indemnity. Coverage and premium rates are settled on the basis of productivity and susceptibility to risk of the lands under cultivation in the same area. Besides an all-risk crop insurance, there are three other main types of insurance to cover the risk from fire, hail and flood.

Crop Insurance in Foreign Countries

The practice of insuring crops against a combination of hazards is in vogue in different parts of the world. Comprehensive insurance against damage to growing crops is available in USSR, Ceylon, USA, Japan etc.

One of the most extensive programmes of crop insurance was begun by the Soviet Union before World War II. In addition to a specific risk insurance extended to many crops, an all-risk insurance was provided for a limited number of crops mainly industrial crops including cotton, tobacco and soyabean. This insurance did not cover low yield resulting from poor germination of seed and exhaustion of soil. With a few exceptions, quantitative losses only and not impairment of quality, are insurable in the USSR.

Rural fire insurance has been introduced in USA and, to a lesser extent, in the countries of continental Europe. Hail insurance for growing crops originated in Germany and Scotland in the second half of the 18th century and later spread to most of the countries in Europe and to America. The first known attempt to provide insurance against flood was made in Austria in 1846. The all-risk crop insurance aims to protecting farmers against the vagaries of weather like draught, excessive moisture, storm, hail, frost, flood, earthquakes and landslide, and also against plant and animal diseases.

In the United States, the Federal Crop Insurance Act, 1938 provided for the creation of a Corporation under the Department of Agriculture with a capital reserve of 2,20,000,000. The administration and management of the Corporation rest on a Board of Directors, consisting of five members drawn from the Government department and private sector. Field administration and supervision are delegated to State and County Committees of the Agricultural Adjustment Agency.

In Japan the all-risk crop insurance programme provides for a subsidy on premium. In recent times it has risen about 75 per cent. The intention of the Government in subsidising the crop insurance programme is to encourage the farmers to keep some marginal lands under cultivation and maintain a rate of premium which will be within the paying capacity of even the poor farmers. *The subsidy in effect meant that all the tax payers in the country share the burden of risk inherent in crop production which primarily affects the cultivators.*

The integration of crop insurance in 1948 with short-term agricultural system has been very helpful to the farmers in Japan. Under this system every farmer who has insured his crop, can borrow up to the maximum amount specified in his insurance policy from the local co-operative. In case he cannot repay because of crop failure, the insurance benefit which falls due on his policy is automatically transferred to the credit institution wherefrom he borrowed. Another important feature in the Japanese system of

crop insurance is its compulsory nature. This element of compulsion is actuated by a desire to eliminate the scope for adverse selection and ensure the widest possible distribution of risk.

Crop Insurance in India

The idea of crop insurance in India was mooted about three decades ago, when a Sub-Committee on "Land Policy, Agriculture Labour and Insurance," *inter alia*, had recommended a national scheme of cattle and crop insurance with agriculturist, the village or the district and the nation collectively contributing to its successful operation.

The first experiment in crop insurance was attempted in M.P., in 1943 in Dawas Junior with a view to provide benefits to the farmer in case of crop failures, if he had paid premium which was based on the actual land revenue assessment. The scheme was compulsory and administered by a Corporation.

In 1946, a "Crop Insurance Scheme" was proposed by Dr. Narayanswami Naidu, for Madras to help stabilize farm incomes—in respect of rice and other major cereals. He suggested that : (i) A crop insurance premium of one anna per acre of land under cereal crop may be collected with land revenue in all the districts except in dry areas susceptible to famine where a higher rate of premium may be charged. (ii) The scheme should be on a cash basis ; (iii) The protection should be given thus : complete failure of crop may be compensated with the value of eight anna crop (or less may be covered up to 50 per cent of the crop,) where only less than four-anna crop has been harvested, the yield should be brought up to the level of eight anna crop."

The Co-operative Planning Committee, 1946, also recommended that "experimental scheme of crop and cattle insurance should be organised under State initiative."

Later on, the preparatory Asian Regional Conference (1947) held in Delhi recommended that "with a view to affording a large measure of income security to cultivators, governments should consider the possibility of organising crop and cattle insurance schemes, either for the country as a whole or for those parts in which it may be possible to take immediate action."

The first concrete step towards introduction of the scheme was taken by the Government in 1948, when a special officer Shri G. S. Priolker was appointed to investigate a systematic and scientific basis for formulating an experimental pilot scheme. Dr. Priolker in his Report, 1949, recommended a pilot scheme covering four crops, (rice, wheat, cotton and sugarcane). Madras (rice and cotton), Bombay (cotton), M. P. (cotton, wheat and rice) and U. P. (wheat, rice and sugarcane) were suggested for experimentation. The financial responsibility of the State Governments was to the extent of paying (a) entire expenses of administration, (b)

direct subsidy, and (c) operating deficits. Shri Priolker recommended that "(i) the scheme should be compulsory with government in over-all charge and it should subsidise it ; (ii) the procedure to be adopted in determining premium and insurance coverage was to be dealt with after taking into account the average yields, soil factors, availability and type of irrigation facilities, variety of crops etc ; (iii) The rates of premium were not to exceed 4 per cent of the average yield and were to vary according to the amount of insurance desired."

This scheme was examined by an expert committee, which suggested the introduction of the scheme at 12 centres. In 1952 the four States of Bombay, Uttar Pradesh, Tamil Nadu and Madhya Pradesh were asked whether they would be able to implement the scheme by sharing 50 per cent cost on State level organisation. While Madhya Pradesh was willing to try the scheme if the entire cost were borne by the Centre, the other States were unwilling to undertake it. The scheme was later examined by the FAO Working Party on Crop and Cattle Insurance meeting at Bangkok in 1956. Experts in insurance and agriculture also considered it suitable for implementation. On account of financial stringencies, however, the Government of India decided to defer the introduction of the Scheme.

Incidentally, it may be mentioned that in 1948-49, almost simultaneously with the Priolkar Scheme, Dr. B. Natarajan prepared a scheme of Crop Insurance for the State. He asserted that the scheme could be distinct fiscal success, bringing to the treasury a net revenue of Rs. 1 crore per annum. To begin with, the scheme was to be limited to paddy. A suitable agency for the administration of the scheme was also suggested.

Punjab Experience

In 1961 the Government of Punjab decided to implement a modified version of the pilot scheme in certain selected areas of the State. According to the scheme, two of the four principal crops, viz., wheat, gram, cotton and sugarcane, were to be insured. It is compulsory, that is to say, all the cultivators who grow any two of the insured crops will have to participate in the scheme. All natural hazards, local or widespread is covered under the scheme. For the purpose of indemnities and premium rates a block is divided into a number of areas homogeneous regarding soil, cultivation practices and production risks. Indemnities and premium rates are to be fixed separately for each crop and each homogeneous area. Crop failures are to be assessed objectively and if the indemnities become payable in respect of an insured crop, every farmer growing that crop in the area will receive indemnities whether or not he suffered loss of yield in respect of that crop. Indemnities are payable when the seasonal yield falls below 75 per cent of the normal yield. The maximum indemnity payable in case of total loss of crop will be half of the normal yield. The premium rates for a crop

in a given area will be such that the premia collected over a number of years balance the indemnities payable over that period. Seasonal yields for the determination of indemnities will be fixed by an objective method of crop-cutting experiments by the field staff provided under the scheme. The administrative cost of the scheme will be borne by the Government. The scheme is to be administered by a Crop Insurance Board which will include experts in agriculture and insurance as members.

The Punjab scheme has several limitations. The basic principle of insurance requires that indemnity will correspond with the loss but the Punjab farmer, under this pilot scheme is assured of indemnity irrespective of his having suffered an actual loss or not. Premium rates have also been fixed in such a way that, collected over a number of years, the amount will balance the indemnities payable over the period. This presupposes that the farmer will have to bear the losses due to natural hazards. This might make the peasants feel that they are bearing a new tax burden, a feeling that should be avoided. The administrative cost which is to be shared by the Centre and the State on a 50 : 50 basis will be about Rs. 7 lakhs per year, which comes to about 17.5 per cent of the premia collected. The cost was on the very-high side. Nevertheless in the Third Plan, a sum of Rs. 40 lakhs was allotted for the purpose. The programme could not be put into operation because of the constitutional hitch—insurance being a central subject, a State Government cannot run even a pilot scheme without an enabling legislation by the Parliament. Therefore in July, 1967, a bill known as Crop Insurance Bill was drafted and the pilot scheme for the introduction of compulsory crop scheme was forwarded to the State Government for support.

New Scheme

A scheme has now been drawn which envisages compulsory insurance in areas in which it is to be introduced. The important features of this scheme are :

(i) Crops and areas are to be specified by the State Governments over which the scheme is to be implemented on a compulsory basis ;

(ii) The area covered will be divided into homogeneous sub-areas and for each sub-area insurance value for each unit (crop plot) will be based on normal yield valued at the average market price of the commodity during the preceding three years ;

(iii) The calamities to be covered are draught, flood, hailstorm, cyclone, frost, and locust attack ;

(iv) Premiums are to be fixed with due regard to probabilities of damage and will not ordinarily exceed 50 per cent of insurable value ;

(v) Indemnity will be paid if the yield falls below 75 per cent of the normal, due to natural calamities, in a sub-area and will be two-third's of the value of the difference between the estimated yield ;

(vi) The valuation will be done with reference to coverage of price in the three succeeding years.

(vii) The maximum indemnity per acre will be half the value of the normal payable in case of total crop failure.

(viii) In order to get indemnity against the loss, the farmers will be required to give notice of damage, which will be paid on the basis of loss as assessed by officers appointed under the Scheme ; and

(ix) The scheme is intended to become self-sufficient in course of time though initially administrative expenditure of the scheme would have to be met from government funds.

The scheme was accepted by various state Governments but due to financial outlays it could not be implemented. The Committee on Crop Insurance has been of the view that because of large financial involvement, compulsory crop insurance scheme could not be feasible. However, it suggested that General Insurance Corporation when it is set up, should undertake a pilot scheme of Crop Insurance, similar to that already being implemented for Hybrid-4 cotton in Baroda district by the L.I.C.

Future Scope and Problems

Although much scope lies for the introduction of agricultural insurance in India, yet a large number of problems stand in its way, such as :

(i) Indian agriculture is beset with uneconomic size of holdings, disincentive tenure condition, uncertain weather conditions, inadequate and costly non-institutional credit facilities ; non-availability of inputs and adequate technical knowledge and experience.

(ii) Inadequacy of essential and reliable long period data on crop yields and losses, occurrence of pests and diseases upon which to base an actually sound insurance programme.

(iii) Variety of agricultural practices, which differ widely not only from crop to crop in the different regions but also for the same crop even in single region. These affect crop yields and hence construction of premium rates creates difficulty and complexity.

(iv) Limited resources at the disposal of the farmers render the levy of premium rates unrealistic.

(v) Ignorance and poverty of the farmers not only makes it difficult for them to understand the real meaning and significance of insurance but also prevents them from paying insurance premium regularly, even if it is a small margin left out of the low income.

(vi) The dearth of sufficiently trained personnel to supervise and execute insurance claims particularly at the field level.

(vii) Complicated land tenure system, incomplete and unreliable records, and absence of proper registration of tillers render it difficult to determine the insurable interests.

In spite of these hurdles, the necessity of crops insurance cannot be over-emphasised. The basic condition is that necessary inputs be made available to the farmers, and their economic conditions improved by improving agricultural practices. Insurance protection which spans crops failure gap, may then prove an essential part of a well rounded agricultural programme designed to provide security to the farmer. This will need that :

(i) cheap and safe insurance schemes be introduced in selected areas ;

(ii) the schemes should cover all risks and losses due to natural calamities which are beyond the capacity of the individual farmers ;

(iii) the premium rates should be reasonable and vary according to the nature of crop insured and other natural conditions of the area involved ;

(iv) the scheme should be a compulsory one ; and therefore the areas should be selected with caution.

Appendix 1

Losses Caused By Plant Diseases and Pests¹

Crop	Name of Disease	Probable Annual Loss %	Name of pest	Probable Annual Loss %
1	2	3	4	5
1. Paddy	Blast, leaf spot and foot rot	10	Stem, borer, Sucking insects, green-hoppers	15
2. Wheat	Rust, Smuts bunts	10	Termites, stem-borers. Sucking insects	3
3. Barley	Rust and Smut	5	Sucking insects	3
4. Jowar	Grain smut	1	Stem-borers, sucking insect	15
5. Maize		1	Stem-borers sucking insect	15
6. Bajra	green cardisease	1	do	10
7. Gram	Blight and wilt	5	Leaf eating caterpillars	10

1. B P, Pal, *Land Transformation*.

8.	Ragi	smut	5	Stem-borers, sucking insects.	10
9.	Sugarcane-red rot wilt and cane smut		10	Borers, sucking insects	10
10.	Groundnut	---	---	Leaf eating caterpillars	10
11.	Cotton	wilt and root rot	25	Leaf eating caterpillars borers sucking insects.	15
12.	Jute	stem rot	5	do	5
13.	Sesamum	wilt and other minor diseases	1	do	5
14.	Rape and mustard	—	—	Sucking Insects	10
15.	Linseed	Rust and wilt	10	Linseed fly	10
16.	Tobacco	virus disease	10	Sucking Insects	10

12.

Agricultural Implements, Mechanisation and Reclamations Scheme

Traditional Implements Used

The tools and implements used by the Indian farmers are comparatively few in number, smaller in size, obsolete, crude and antiquated in character, and simple in kind and very insignificant in value, as compared to the most up-to-date farm implements used by the Western farmers. However, the implements used in India are light, portable and within the capacity of drought oxen. These are of various types, such as : (i) the iron-shod wooden plough and the plough-share, used for the upturning of the soil and driven by either a pair of bullocks or buffaloes ; (ii) the *wooden yokes* in which bullocks are yoked either for hauling the plough or at the time of lifting water from the wells ; (iii) the *seed drill* which is generally made out of a long, hollow piece of bamboo with a funnel at the upper end, facilitates even distribution of seed into the newly-made furrows by the plough, to the handle of which this implement is tied while sowing ; (iv) the *pata* or the leveller used for levelling the field preliminary to sowing ; (v) a massive wooden roller used for crushing clods ; (vi) a *charsa* for drawing water from the wells ; (vii) a big and heavy rope ; (viii) a wooden structure of strong logs of wood raised on one side, upon which a pulley is set which facilitates the movement of the rope fastened with the leather bucket ; (ix) a spade or *kudali* used for irrigating purposes and to some extent in assisting the ploughs ; (x) The *khurpi* used for harvesting ; (xi) the *jeli* or fingered fork used for weeding and spacing out ; (xii) the sickle used for upturning the harvested crop when it is being trodden by the feet of the bullocks for separating chaff from the corn ; (xiii) a long, rough, thick woven cloth used either in covering the crop on the threshing floor from rain or winds or in taking it to the market ; (xiv) the cart used for transporting purposes but owing to its prohibitive cost it is not within the reach of every peasant.

The Need for Improved Implements

The result of the use of such implements is that the indigenous plough does not penetrate deeply into the soil or widely enough. It

takes about 10 days to get a good seed-bed of one hectare with woodenplough. Further, the practice of broadcasting seed and fertilizer leads to a considerable wastage of both. The high-yielding varieties in general have a more critical time schedule for harvesting and threshing. Threshing becomes exceedingly difficult on too early a harvest. On the other hand, if there is a considerable delay, there is much loss through shedding.

With the introduction of high investment intensive agriculture and multiple cropping, it has become essential to ensure timely operations of satisfactory quality that can only be achieved by using efficient and well-adopted machinery and implements. It is essential to remove yield-reducing handicaps like poor and delayed seed beds, land preparation and sowing, lack of fertilizer placement, poor distribution of irrigation or protected harvest and threshing operations. All these can be done if improved, efficient and labour saving devices and durable implements and tools are used. This need has given rise to demand for improved tools and implements. Consequently, during the past 40 years there has been sufficient advance towards the evolution of more efficient and improved implements such as iron plough, seed drills, harrows and cultivators, soil-scoopers, clodcrushers, ridgers, chaff-cutters, groundnut diggers, hullers, and decorticators, turmeric polishing machines, maize shellers threshers and winnowers, iron sugarcane-crushing mills, iron persian-wheels, sugarcane juice boiling furnaces, sprayers and lusters, tractors and bulldozers and water sprinklers.

Criteria for Improved Implements

Improved implements must satisfy the following conditions ;

- (i) They should be simple, as illiterate and semi-literate farmers have to use them.
- (ii) Their prices should be within the means of average Indian farmers.
- (iii) The implements and machines should be sturdy because they are handled by villagers under difficult conditions.
- (iv) Their design should be such that they can be repaired in the villages and their spare parts available locally.
- (v) Any new implement or machine should be significantly more useful than the existing ones. Only then will the farmers come forward to adopt them.
- (vi) The implements should be light for transporting from village to the field and be suitable for the type of animals used.
- (vii) They should be scientifically tested on a fairly uniform basis for facilitating comparison.
- (viii) As far as possible, locally available materials should be used for designing the implements.

Progress in the Use of Improved Implements

Now, Indian farmers have started using extensively power-driven machines, electric motors, diesel engines etc. Table below shows the progress of agricultural machinery in India.

Power driven Agricultural machinery in India (in 000)

Description	1951	1956	1961	1966	1972
Tractors (for agricultural purposes only)	9	21	31	54	140
Electric pumps (for irrigation)	25	47	160	415	1,618
Oil Engines (with pumps for irrigation)	82	123	230	471	1,628
Sugarcane crushers	21	23	33	45	87

The advent of intensive cultivation has increased the demand for tractors. While *wheel tractors* in the range of 20 H.P. are used for cultivation on farms of 25 to 50 acres ; *crawler tractors* and bigger wheel tractors are used for land levelling, deep ploughing and other kinds of soil and water conservation measures. *Power tillers* and *small walking tractors* with horse-powers, ranging from 5 to 8, are suitable for wet land cultivation, where the smallness of holdings with intervening bunds and irrigation ditches would render the four wheeler tractors difficult to operate. These are very versatile and can be used for power-pumping, spraying, harvesting and transport with appropriate attachment.

State-wise Distribution of Tractor Population

State 1	1956 2	1961 3	1966 4	1971 5
Andhra Pradesh	1,626	1,762	2,911	5,000
Assam	159	489	830	1,250
Bihar	1,227	1,520	2,132	4,000
Gujarat	1,052	1,999	3,248	16,000
Jammu & Kashmir	106	132	104	750
Kerala	1,187	276	418	2,000
Madhya Pradesh	1,311	2,025	2,513	4,000
Tamil Nadu	822	1,387	3,278	9,000
Maharashtra	2,066	1,427	3,262	6,000
Karnataka	807	981	2,595	5,000
Orissa	95	194	673	1,000
Punjab & Haryana	3,809	7,840	15,489	45,000+17,000
Rajasthan	1,274	3,154	4,495	11,000
U.P.	5,839	7,139	10,788	35,000
West Bengal	450	330	1,891	3,000
Delhi	132	258	665	—
Himachal Pradesh	3	4	23	—

1	2	3	4	5
Manipur	6	—	6	—
Tripura	7	13	9	—
Dadra & Nagar Haveli	—	—	6	—
Andaman & Nicobar Islands	2	1	—	—
Pondicherry	—	—	52	—
Goa	—	—	127	—
Nagaland	—	—	9	—
TOTAL	20,980	30,931	55,222	—

The promotion of improved implements can be encouraged if the Government assumes the responsibility for undertaking research, testing, standardisation, production of prototypes, financial support, quality control, development of infrastructure and demonstration. The *Study Team on Agricultural Development* (set up by the Administrative Reforms Commission) has suggested that the "Government should not go into the manufacture of improved implements if co-operative and private sector units with adequate encouragement can do this job..... The promotion of implements should be through demonstration of proved profitability from their use". The Government should also assemble resources like technical and managerial man-power, and repairing and training services.

MECHANIZATION OF AGRICULTURE

Meaning of Mechanization

Farm mechanization is a term used in a very wide sense. It not only includes the use of machines, whether mobile or immobile small or large, run by power and used for tillage operations, harvesting and thrashing but also includes power lifts for irrigation, trucks for haulage of farm produce, processing machines, crushing sugarcane, grinding and mixing feed, spraying implements against pests and diseases, dairy appliances for cream separating, butter making, oil pressing, cotton ginning, rice hulling, and even various electrical home appliances like radios, irons, washing machines, vacuum cleaners and hot plates.¹ According to Dr. Bhattacharjee, "mechanization of agriculture and farming process connotes application of machine power to work on land, usually performed by bullocks, horses and other draught animals or by human labour."² It chiefly consists in either replacing, or assisting or doing away with both the animal and human labour in farming by mechanical power wherever possible. This necessarily implies a change in the economic and cost structure of farms, inasmuch as the ratio of

1. G. D. Agarwal, "Economics of Mechanization of Agriculture in India" *Indian Journal of Agricultural Economics*, Vol. IV, No. 1, 1948.
2. Bhattacharjee, J. P., "Mechanization of Agriculture in India". *Ibid.* p. 121.

capital to labour increases enormously and the proportion of different items of cost per unit of production undergoes a revolutionary change.

Mechanization may be either partial or complete. It is partial when only a part of the farm work is done by machine. When animal or human labour is completely dispensed with by power supplying machines, it is termed as complete.

In Western countries notably in North American continent, mechanization of agriculture is more or less complete. This has been necessary because of the shortage and high cost of farm labour. Complete mechanization on a vast scale has been adopted in Russia as a means to large-scale exploitation of land and increased production therefrom, in spite of the fact that before the Sovietization of Russia the whole agricultural structure of the country was on the basis of peasant farming. During World War II. the United Kingdom was forced, on account of man-power shortage, to adopt partial mechanization on a large scale in order not only to keep up production, but also to expand production considerably in the few instances. Mechanization has also been resorted to in Australia, Brazil and Canada where there is "low pressure of population, scarcity of labour and high wage level." Denmark, France, West Germany, Austria, Sweden and Netherlands have also adopted mechanized farming.

But in countries like China, India, greater part of Asia, Africa and S. America, the mechanization has progressed to a very limited scale due to abundant supply of the man and animal power, subdivision of holdings, lack of fuel-power and the poverty of the masses. Whereas in France and Denmark, farms were well equipped with agricultural machinery and all work—right from sowing, ploughing to harvesting—is done by machinery.¹

Broadly speaking, mechanisation of agriculture has two forms. connected with the farm jobs, viz, jobs requiring traction work, i.e., mobile mechanisation. If attempts to replace animal power on which agriculture has been based for very many centuries, mobile mechanization needs the use of machines for such jobs as pulling and drawing efforts, e.g., ploughing, and tillage operations like harrowing, levelling, rolling, seeding, harvesting and hauling of produce. The other type is stationary type of mechanisation, which aims at reducing the drudgery of certain operations which have to be performed either by human labour or combined effort of human beings and animals such as lifting water for irrigation, threshing, winnowing, bagging, crushing sugarcane, grinding and mixing live-stock feed, hulling rice and shelling maize cobs. These jobs can be performed by machines

1. L. F. Easterbrook, *Farming and Mechanised Agriculture*, 1945, p. 55.

Types of Farm Machines

Invention of new machines has widened their scope to operations which hitherto could be performed by hand or manual labour only. The new trend in manufacturing tractors and agricultural machines is to make them more adaptable on small farms and convenient for small pockets. Their efficiency is increasing resulting in greater economies in operation and saving of money in comparison to manual labour. Some of the more used agricultural machines are :

- (i) *Tractor* ploughing dispenses with the wooden plough of yoke and the need for draught animals for cultivation of land.
- (ii) *The combined drill* performs both sets of operations of sowing the seed and putting the fertilizer simultaneously.
- (iii) *The combined harvester* simplifies the work of reaping and thrashing into a joint process and renders obsolete the use of sickle, the pitchfork and the scoopshovel.
- (iv) *Potato harvester* digs, gathers, grades, sacks, weighs and delivers the potato to a waiting truck with an estimated saving of 50 dollars a day or more over the old way of handling the crop.
- (v) *The experimental planter* opens the bed, plants seeds and places fertilizer all at one time. This considerably saves the quantity of fertilizer.
- (vi) *The cotton picker* extracts lint-cotton from the open balls.
- (vii) *The sugarcane harvester* cuts the cane and loads it at a speed of 7 or 8 maunds an hour with an estimated saving of $1/2$ to $1/3$ of the hand harvest labour.
- (viii) Oil engines and electric pumps are used for irrigation purposes.
- (ix) Aeroplanes are used for dusting and spraying crops against pests and diseases.

Plant setting, vegetable and small fruit production hedge demolition and drainage operations, tractor spraying of the insecticides, cotton picking and even some of the household work of the farmer's families have been increasingly mechanised in the West. The lorries and the railways, the system of elevators and conveyors have come into general use for transport, marketing and storage of farm products and livestock. In modern agriculture machines are being increasingly employed in one way or another in almost all farming operations ranging from breaking up the soil to the marketing and the sale of the produce of the farm. This is made possible largely due to extension of electricity in the countryside, manufacture of agricultural machinery suitable for farms in varying climatic and

geographic circumstances and the dispersion of instruction in technical and rural engineering at the agricultural schools. Electricity is used for working of such machines as feed grinders, ensilage cutters, seed cleaning machinery and milking machines and also to furnish lights and power in the farm-households and the farm buildings.

Power Requirements of the Farm

Laying down the criterion for the use of machines in agriculture Danson remarks that, "in countries where machines are cheap while labour is expensive, and moreover, of a type qualified to understand and care for them, a free use of machines is indicated and the introduction of labour saving implements will generally result in a direct saving of outlay : even if it does not, the additional expense is so small and the need of economy in labour so great that its use is economical." If we apply this criterion to India we find the machines are expensive as they are not manufactured in the country. Fuel is costly. Labour is cheap and unskilful in the use and care of machines. It follows that the extent to which the labour saving device is an economy it is much more limited here than in U.S.A., or other Western countries.

However, there can be no two opinions on the urgency of mechanical help for increasing production where it creates further employment or does not compete with the bullock and human labour. Power is required on the farm for performing two kinds of jobs : (i) *First*, traction work requiring pulling or drawing efforts such as ploughing and land preparation, seeding, inter-culture, harvesting, etc., and also hauling. (ii) *Second*, stationary work such as water-lifting, threshing, sugarcane crushing and other jobs of like nature. The available sources of power on the farm are domestic animals, heat engines and electric power. While electric power, which is at present available on a very limited scale, is confined entirely to stationary work, animal power and heat engines have proved applicable for both traction and stationary work. In India, the power required for agricultural operations is mostly supplied by animal power and human hand.

Benefits of Mechanisation

(i) **It Increases Production.** Mechanisation increases the rapidity and speed of work with which farming operations can be performed. According to D. R. Bomford, "The ploughman with his three-horse team controlled three-horse power, when given a medium-sized crawler tractor controlled between 20 to 30 horse power. His output, therefore, went up in the ratio of about 8 : 1." In the U. S. A. a labourer who formerly ploughed one acre of land

1. *Year Book of Agriculture* (1943--47), S. L. Johnson in *Science in Farming*, p. 922.

with a pair of horses is now able to account for 12 acres a day with a gasoline-driven tractor. By this quickening of agricultural practices the human labour required is minimised. Over a period of three decades in U. S. A., a study revealed that one third increase was due to the use of chemicals ; another one third due to better varieties, and wealthier seeds, while another one third was due to improved farm machinery.¹ As a result while the volume of production has undergone considerable increase in U. S. A., the number of people engaged in agriculture has been reduced. The average area of land per farm increased in U. S. A., from 136 acres in 1890 to 215 acres in 1950, while the number of workers per farm in the same period decreased from 2.0 to 1.6 which means that on a given area at a farm, there was a fall of 50% in the number of workers. A more recent and more spectacular development in mechanisation of agriculture has been brought in the U.S.S.R., where agricultural output increased four times that of 1913 and grain production alone increased by 70 per cent by 1960. By 1965 Socialist competition, increased electrification and more machinery were supposed to induce a 100% increase in the efficiency of agricultural labour in that country.²

A survey undertaken about the impact of mechanisation on yield of major crops, gross output per hectare or the output per man-day of human labour has revealed that there has been an increase in these on the mechanised farm than that on non-mechanised farms. The yield of sugarcane, wheat and paddy per hectare increased by 25.6, 26.1 and 27.9% on the mechanised farms over the non-mechanised farms ; while the gross output per hectare increased by 22.6% and that of out-put per man-day by 24.3%.³

According to a study carried out by the National Council of Applied Economic Research for the National Commission on Agriculture on a representative sample of tractorised and non-tractorised farms of small, medium and large holdings in U. P., the net impact of mechanisation was that tractorised farms had an increased productivity of over 37 per cent. per cultivated hectare. The average yield value per hectare of tractorised farms was Rs. 5,213 as compared to Rs. 3,821 in the case of non-tractorised farms. This extra food production would not have been possible without mechanisation. Details of the impact of mechanisation is shown in the Table below :

-
1. B. K. S. Jain, "Mechanisation Can lead to Swift Changes," in *Productivity*, Vol. VI, 1965 p. 499.
 2. Roy D. Laird, "Soviet Goals for 1965 and Problem of Agriculture". *Productivity*, *Ibid.*, p. 282.
 3. R. Singh and B. B. Singh, *Seminar on Farm Mechanisation*, July, 1972

Impact of Mechanisation on Farms
(Per Cultivated Hectare)

Size of Farm (hectares)	Value of Output from				Rs.
	Crops	All farm activities	Cost of inputs	Net Profit	
Tractor Farms					
—4.50	4313	5188	4085	1103	
4.50—8.00	4787	5357	3046	2311	
8.00+	4619	5095	2517	2578	
Non-Tractor Farms					
—4.50	2926	3714	2787	927	
4.50—8.00	3887	4278	2116	2162	
8.00+	3716	3472	1586	1886	
% Grains on Tractor Farms					
—4.50	47.4	39.7	46.6	19.0	
4.50—8.00	23.2	25.2	44.0	6.9	
8.00+	48.6	46.7	58.7	36.7	
Average Gain—	37.5	36.4	49.8	20.9	

Statewise Mechanisation and Productivity

State	Cropped Area (000 hectares)	Est. Tractors in Agriculture	Tractors per 1000 hectares	Foodgrains Kgs. Ha
1. Punjab	5441	45000	8.26	1775
2. Haryana	5150	17000	3.30	1192
3. Uttar Pradesh	22709	35000	1.54	903
4. Gujarat	10420	16000	1.52	960
5. Tamil Nadu	7309	9000	1.23	1208
6. J. & K.	808	750	0.93	1434
7. Kerala	2758	2000	0.73	1339
8. Rajasthan	16657	11000	0.66	418
9. Karnataka	10417	5000	0.48	748
10. W. Bengal	6653	3000	0.45	1200
11. Assam	2907	1250	0.42	890
12. Andhra Pradesh	12794	5000	0.39	784
13. Bihar	10895	4000	0.37	760
14. Maharashtra	19197	6000	0.31	509
15. Madhya Pradesh	19653	4000	0.20	591
16. Orissa	7446	1000	0.13	876

(ii) **It Increases efficiency and Per Man productivity.** Mechanisation increases the efficiency of labour in agriculture and raises the agricultural production per worker. By its nature it reduces the quantum of labour required to produce a unit of output. In the U.S.A., "the amount of human labour used to produce 100 bushels of wheat

dropped from 320 hours in the year 1830 to 108 hours in 1900 ; by 1940 a new series of improvements had reduced labour requirements to 47 hours."¹

"Before the World War I, it took about 35 man hrs. to grow and harvest an acre of corn ; 15.2 hrs. an acre of wheat and 15.7 hrs. for an acre of oat. In 1945—48, the labour requirements were 23.7.6.1 and 8.1 man hours respectively. The combined effect of fewer hours and more bushels per acre has resulted in more than halving labour requirements per unit of production. The number of man-hours required in 1910-14 per 100 bushels of corn was 135, of wheat 106 and of oat 53 ; in 1945—48, the corresponding figures were 67, 34 and 23 respectively."² It is estimated that productivity per man on farms in U. S. A. is about four and a half times that in the U.S.S.R.³ In the U.S.S.R. in collective farms, production has raised labour productivity to a high level compared with the pre-revolutionary days ; now labour is three times more productive there.⁴

(iii) **Mechanisation increases the yield of land per unit of area.** S.E. Johnson holds that of 28 per cent increase in farm output in U.S.A., above the average of 1934—39 "only about one-fourth is due to better weather, probably less than 15 per cent has resulted from expansion of crop, land acreage, and the rest, about 60 per cent is largely accounted for by the fuller use of the improvement in crops, livestock and machinery."⁵ Increase in the yield of crops, due to mechanisation of farms has been traced from 40 to 50 per cent in the case of maize ; 15 to 20 per cent in Bajra and Paddy ; 30 to 40 per cent in Jowar, Groundnut and Wheat.⁶

In U.S.A. the yield per acre of every important crop was considerably higher in 1948 than in 1926—35 ; corn yielded 42.8 bushels per acre as against 13.9 and wheat 18.0 and 13.0 respectively. In case of rice U.S.A. yielded about 40 bushels per acre.

(iv) **Mechanisation results in lower cost of work.** It has been universally recognised that one of the methods of reducing unit costs is to enlarge the size of the farms and go in for more intensive farming. It is found that the cost of production and the yields can be adjusted

1. Bureau of Agricultural Economics (U. S. A. Deptt. of Agriculture). *The Farm Cost Situation*, Sept. 1946, p. 28.

Cf. "At the beginning of U. S. A's history, 9 out of 10 people lived on farms, today the number is fewer than 1 in 6."—U. S. A. Department of Agriculture, *The Year Book Agriculture (Marketing)*, 1954, p. 9.

2. R. W. Hecht and G. T. Barton, *Grains in Productivity of Farm Labour*, 1950, pp. 9—11.

3. N. Jasny, *The Socialized Agriculture of the U.S.S.R.—Plans and Performances*, 1949, p. 17.

4. N. Anisimov, *Soviet Agriculture*, 1957, p. 28.

5. S. E. Johnson, *Op. Cit.*, p.926.

6. *Rural India*, June 1957, p. 186.

properly if mechanisation is resorted to. The table below shows that the cost of work and the capital outlay for power farming as compared to animal power is much less.¹

Cost of Tractor Farming with one 40 h. p. tractor	Rs.	Cost of Bullock farming with 40 pairs of bullocks to equal 40 h.p.	Rs.
Purchase price of tractor and implements	25,000	Purchase Price of Bullocks @Rs. 400/- each	32,000
Annual Depreciation running exps. per hr.		Annual depreciation	3,000
Fuel and Lubrication 6.0-0 per year of 2,000 hrs.		Cattle fodder @ Rs. 40/- p.m. per pair of 40 pairs per year	19,200
Cost of labour :—		Cost of labour :—	
One driver @ Rs. 90/-		40 men for 8 months—	
Two mechanics @ Rs. 60/- per month	2,520	Rs. 25/- each p.m. 10 men	
Annual repairs	2,000	for the whole year	11,000
Total	41,520	Total	65,200

(v) It brings in other improvements in agricultural technique, notably in the sphere of irrigation, land reclamation and the prevention of soil erosion. The present day dependence on the monsoon as the only irrigator of crops in India can be obviated by a more scientific approach. Besides, ploughing by tractor reclaims more land and thereby extends the area under cultivation, as the tractor smoothens hillocks, fills in depressions and gullies and eradicates deep-rooted weeds. It also prevents soil erosion. Besides mechanical fertilization, contour bunding and terracing are done by mechanical methods with the help of self-propelled graders and terracers.

(vi) It contracts the Demand for work animals, for ploughing, waterlifting, harvesting, transport, etc. In actual operation, costs amount to little when machines are idle, whereas the cost of maintenance of draught animals remains more or less the same during both periods of working and idleness, because animals have to be fed and attended to whether they are doing work or not. It is, therefore, advantageous to use tractors when a great deal of work has to be done in a short time or in highly specialised forms of agriculture characterised by comparatively short periods of inactivity. On the other hand, employment of animals works out more economical when the work is spread evenly over the entire year.

(vii) It leads to Commercial Agriculture. Mechanisation has always resulted in a shift from 'subsistence' or 'peasant farming' to 'commercial agriculture'. This shift occurs mainly due to the need for more land and capital to be associated with each farmer in order to reap the full benefits of technology. This in its turn gives rise to two tendencies in the agricultural economy ; (a) gradual re-

1. Quoted by Mrs. Mehroo Jussawala in "Mechanisation of Agriculture," *Indian Journal of Agricultural Economics* Vol. IV, 1, 1948, p. 156.

placement of domestic or family labour by commercial or capitalistic methods, and (b) search for international markets for agricultural produce.

(viii) **It modifies social structure in Rural Areas.** Mechanisation results in a significant modification of the social structure in rural areas. It frees the farmers from much of the labourious, tedious, hard work on the farms. Life becomes more beneficial and the standard of living rises. The pressure on land decreases and the status of the agriculturists improves.

(ix) **It releases manpower for non-agricultural purposes.** Since the mechanisation of agriculture results in the employment of lesser number of persons on farms, surplus manpower may be available for other economic activities. In U. S. A. mechanisation has been responsible for the release of about 20 percent of workers for non-agricultural purposes. In irrigated areas and in areas which suffer from shortage of labour as compared to requirements for proper cultivation of the available land, the labour so rendered surplus can be gainfully employed in bringing more land under cultivation or in introducing labour intensive crops in the farming pattern or in attending to operations like weeding, interculture and hot weather cultivation which were not attended to with the same intensiveness before mechanisation.

(x) **It increases Farm Income.** With the introduction of mechanisation in agriculture the farm income as well as the individual income increases. "It accounts for the unparalleled rise of national income and with it the standard of living, it builds cities, it raises an everloftier superstructure of financial, commercial and other cultural institutions; it turns loose economic agglomerates into social economies to closely knit by a thousand lines of interdependence. It creates much of the capital surplus on which modern economic progress is largely based. It constitutes the lion's share to the public funds which support education, health and law and order. In short, not only do machine industry, and mechanisation and science render agriculture efficient, they create the very world in which this efficient agriculture can sell its bountiful crops."¹ Due to huge farm surpluses, the farm population gets sufficient savings potential to invest for capital formation.

(xi) **It results in Better use of Land.** Mechanisation also results in better utilization of agricultural lands, because "the substitution of gasoline tractor for animal power means reduced demand. The use of machine energy, therefore, leads to good agricultural production, to trade to many crops, or saleable animal products in short, to an exchange economy and a system of land utilization in which cultivator rests on a different and infinitely more complex basis than is found in the local self-sufficient economy."²

1. E. G. Nourse, "The Place of Agriculture in Modern Institutional Society," *Journal of Political Economy*, June-July, 1919.

2. *Indian Society of Agricultural Economics, Readings in Land Utilization*, p. 52.

(xii) With the introduction of mechanisation in agriculture the surplus animal power would be reduced so that large areas of land required for producing fodder for it can be utilised for producing food for human consumption. The remaining cattle population would be better attended to and better fed under mechanised agriculture, for new and nourishing varieties of feeding stuff would be grown in culturable waste lands after reclaiming them for cultivation.

The recent pilot study conducted by the Government on the effect of introduction of tractors on agricultural production has pointed out that the average of 8 persons on a farm was neither surplus nor inadequate to the requirements. Labour rendered surplus by tractor is utilised to increase production through better and timely operations. Besides, the surplus labour force is also absorbed in irrigation programmes, construction of roads, houses and in technical know-how relating to mechanisation. Further, mechanisation itself will lead to demand for more coal, iron, and steel and more transport, as a result of more employment opportunities will be created. "The welfare of agriculture is enhanced by industrial expansion just as the welfare of general society is improved by increasing efficiency in agriculture."¹

The study also finds that the crop yield has been significantly higher in tractor farms in respect of major crops like wheat, gram, jowar and cotton. The average yield of wheat was 10 per cent higher in tractor farms.² This is attributed to adequate tillage operations and timely sowing. A relatively high value crop like wheat accounted for an average of nearly half the area of a tractor farm as against a little over onethird in others. This is so because of early completion of pre-sowing operation which is not possible in farms where bullocks are used. When sowing is delayed, the germination of the seed and the growth of the crop is impaired. Farmers who do not use tractors, therefore, do not take the risk of sowing wheat over a large area but instead cultivate gram, peas and barley.

Regarding the displacement of animal power it may be said that India definitely has a surplus cattle population, it being 54 per 100 acres as compared to 25 in Egypt, 15 in China and 6 in Japan. If this surplus cattle population is liberated from the farm work, more land could be put to produce food stuffs and other raw materials. Moreover, when the cattle are few they would be better attended and better fed, thus, leading to an improvement in their condition. Besides, the liberated cattle may be used for antierosion

1. H. G. Halcrow, *Agricultural Policy of United States*, 1956, p. 176.

2. "In the Suratgarh farm of Rajasthan, production of wheat was 2,100 lbs. (31-1 quality) and 1,200 lbs. (C-591 quality) per acre in 1958-59 as compared with 1,875 lbs. and 1,012 lbs. in 1956-57 respectively. Similarly, paddy production per acre was 3,200 lbs. in 1959-60 in comparison to 3,098 lbs. in 1956-57."—*Making the Desert Bloom, Central Mechanized Farm, Suratgarh*,

work, grading, manure spreading, fodder cutting, shelling, milling wheat, bone and lime-crushing, oil pressing etc.

The surplus cattle may also be used for transport purposes in the absence of motor trucks and good roads, and for harrowing and minor operations which are often performed less economically by tractor power. Further, "the gradual replacement of animal power by machines would result in a healthy dairying activity in which health and well-being of the cattle would be regarded as a matter of permanent importance."¹ Thus, mechanisation would not have any adverse effect on surplus cattle population.

Scope of Mechanisation in India

Though the prospects for wholesale mechanisation of agriculture are not very bright in India, yet partial mechanisation in some respects and complete mechanisation in other respects is possible in the following circumstances :

(a) *To get timely operations done on the field*, machines may be used, otherwise the crop yield may be small if sowing is not done in right time.

(b) *To intensify multiple cropping*, and harvesting operations, use of suitable machine is important.

(c) *To meet labour shortages*, in areas where agriculture is done round the year, use of machinery is preferred.

(d) *To undertake costly operations*, which otherwise would be difficult to perform.

(e) *To take up more thorough work*, as in ploughing and harrowing, machines would be more beneficial than human or animal labour.

However, the following fields of agricultural activity are the logical domain of mechanisation in India, where manual methods would be insufficient and expensive :

1. Reclamation of lands infested with deep rooted weeds and grasses like *kans*, *hariali*, and *doob* by deep ploughing with the help of tractor-driven implements.

2. Land improvements by land-levelling and grading with the help of bulldozers and other heavy machines.

3. Construction of dams and reservoirs, soil and water conservation works such as contouring, terracing, bunding to check the menace of soil erosion.

4. Jungle clearance and opening up virgin lands for cultivation.

5. Deep ploughing, chiselling, more drainings, and other operations like lifting water from great depths in the wells.

1. D. A. Gadkary, *Mechanical Cultivation in India*, 1957, p. 4.

6. Making roads on the farms, hauling farm produce, for processing of farm produce such as rice hulling, oil extraction, sugarcane crushing and decorticating of the groundnuts, plant protection measures like spraying, dusting and fumigation, and

7. Large co-operative farms.

8. For ploughing of clayey soils, that are difficult to handle when the time for preparation between crops, or after heavy monsoon rains and before sowing, is too short for effective results by bullock-driven implements.

9. Intensive and extensive cultivation in sparsely populated areas.

10. Big farmers' holding of more than 30 acres of land.

The use of improved land implements and bullock-drawn machines like mould-board plough, cultivators, seed-drills, reapers, has a great scope in Indian agriculture. Their increased use is sure to add to the quick harvesting of crops, making land available after paddy for producing peas and gram, hot weather cultivation after rabi harvest, raising early forage crops or green manure on fields ploughed during summer, quick preparation of seed bed and rapid harvest on vegetable farms, deeper cultivation in sugar-cane. In other words, it will add to the increased production by better farm work and timely cultural operations.

Progress of Mechanisation in India

The First and the Second Plan did not indicate any specific targets for agricultural implements. *The First Plan* stated, "Heavy machinery like tractors had a limited scope. Care would have to be taken to see that their use for general cultivation work 'does not cause unemployment'. The small size of holdings, the absence of avenues of employment other than agriculture, the shortage of fuel oils and iron and steel are factors which militate against the use of tractors in this country for cultivation on any substantial scale and by and large, Indian agriculture will continue to depend upon animal power for a long time to come."

The *Second Plan*, however, went a step further and gave rough estimates of the requirements of power driven agricultural machinery. It recommended a product target of 200,000, 210,000 numbers of diesel engines (ranging from 1 to 50 H.P.); 86,000 power driven pumps and 5,000 tractors of all types.

The *Third Plan* noted that "a serious gap in agricultural programme undertaken during the *First* and *Second Plan* has been in the field of improved agricultural implements. There is a general recognition of the importance for scientific agriculture of improved tillage and harvesting practices, but specific action has been slow and inefficient.

The *Fourth Plan* has observed that "the programme of implements and machinery continues to suffer from a variety of short-

comings, such as lack of suitable designs in implements, high cost of manufacture in the case of some implements, lack of adequate facilities of repair and maintenance and supply of spare parts. There has been absence of standardisation in agricultural implements". Accordingly all these problems received due consideration through expansion and intensification of research in agricultural engineering, improvement of arrangement for fabrication of agricultural implements and provision of better services for distribution and maintenance.

In the *Fifth Plan*, a policy of selective mechanisation will be adopted, the general objective being to increase cropping intensity and farm productivity. The present availability in terms of power is estimated at 0.4 H. P. per hectare (of which machine power is only one-fourth). It is extremely inadequate and hence needs to be stepped up. The advent of intensive cultivation has further increased the demand for tractors. According to the Fifth Plan estimate the annual demand of tractors is expected to increase from a level of 35,000 in 1973-74 to 80,000 annually in 1978-79. As regards power tillers, the demand is expected to go up from 3500 units to about 20,000 units. Thus, the population of tractors in the country is expected to go up from 2 lakhs to 5 lakhs and of power tillers from 10,000 to 100,000 during the course of the Fifth Plan. Other measures to be undertaken during the Fifth Plan would comprise introduction and popularisation of improved tools and implements, undertaking of special schemes for trials and demonstrations of implements like seed-cum-fertilizer drills, organisation of a prototype production designing centre, spread of the knowledge of design features and functional performance of the equipment under various crops and soil conditions.

The states of U.P., M.P., Rajasthan, Tamil Nadu, Karnataka, Maharashtra, Kerala, Bihar and West Bengal have undertaken mechanised farming on state farms. The Central Government have been giving financial assistance to the State Governments for grant of loans to the cultivators for the purchase of tractors. These States purchased farm tractors and owned them in fleets for undertaking land reclamation, weed eradication, prevention of soil erosion and regular cultivation work in farmers' land. This has many advantages in servicing, maintenance and efficient operation of the tractors. Only the more difficult operations as ploughing the land are done by the tractors, while the lighter operations as cultivating, seeding and weeding are done by the farmers with their bullocks.

The Central Tractor Organisation of the Government of India which functioned from 1947 has done useful work in jungle-clearing operations in Terai and elsewhere. State Tractor Organisations have been working in many States.

There are at present 13 large mechanised farms in the country. The central mechanised farm at Jammu was set up in 1952. It not

only reclaims the area, but also makes available pure cereal seeds for further multiplication in the State. The land here is cultivated by the displaced persons and paddy, pulses, sannhemp and fodder are grown.

The second farm is at Sultanpur in Bhopal. It was started in 1955 to resettle the evacuees and for that purpose land was reclaimed and brought under cultivation, the chief crops being paddy and pulses.

The third farm is the biggest one—covering an area of 12,141 hectares in a compact block set up in 1956 at Suratgarh. Here about 18,300 acres of land is fit for growing crops if an assured water supply is available ; 4800 acres is alkaline and can be reclaimed by application of gypsum when perennial irrigation becomes available. Nearly 7,500 acres is saline. As a result of soil survey and consideration of other factors, the eventual lay-out of the farm has been somewhat as follows : (i) 22,670 acres for cultivation ; 2,000 acres for orchards (maltas, lemons, grape, date-plants, etc.—a nursery supplies select stock of various plants to the people) ; 1,500 acres for animal husbandry schemes (about 150 bulls of the Haryana and Murrah breeds ; 200 pedigree rams of the Bikaneri breed and about 10,000 poultry are expected to be available for up-grading indigenous stock) ; and 4,500 acres for roads, buildings, irrigation channels, forest belts, etc. The Plan includes plantation of shelter belts of trees along the farm roads, and thick hedges along the periphery.

A similar mechanised farm at Jetsar in the Rajasthan canal area was set up in the 1964-65 season.

Other farms are :

Lushaichera farm in the Mizo Hills, where a number of crops like paddy, maize, sugarcane, pineapple, jute, orange, lemon, arhar, banana, guava, arecanut, tapioca and pepper have been tried. It has a total area of 1,820 hectares. A piggery and poultry section also works here.

Jullundar farm is mainly concerned with custom work, viz. land levelling, soil conservation and harvesting on the lands of private parties.

Raichur farm is suitable for production of cotton and oilseed. It grows newer varieties of cotton (i.e., Gujarat Hybrid No. 4 Hybrid Varalaxmi, Sea Island, Raichur 5117, Hampi) and sunflower.

Cannanore (Kerala total area 4856 hectares), *Jharsuguda* (Orissa), *Hissar* (Haryana), *Chengam*, *Kohilbari*, *Lokichera*, *Bahraich* and *Khamam*, are other farms which are completely mechanised. These are under the administration of the State Farms Corporation. The total area of all the Central State Farms is about 40,000 hectares.

The State Farms Corporation of India was set up in May, 1969 with an authorised capital of Rs. 7 crores to establish and run

agricultural farms for the production of seeds, and foodgrains, fibre crops, plantation crops, oilseeds, fruits and vegetables, etc. and to carry out development and reclamation of land belonging to private parties on payment of full cost of these operations.

Agro-Industries Corporations

There are 17 State Agro-Industries Corporations. In the initial stages, all these Corporations concentrated mainly on distribution of tractors, power tillers, pump-sets and other items of agricultural machinery on cash and hire purchase basis and supply of other agricultural inputs. They have diversified their activities to other fields like manufacture of agricultural implements and machinery, spare parts for tractors, processing of fruits and vegetable products, setting up of cattle and poultry feed plants, oil extraction plants, compost plants for the manufacture of organic manures, maize milling complex, NPK granulated fertilizer manufacturing plants, fisheries project and processing of fish products, nylon net manufacturing plants for promoting fishing industry, project on agricultural aviation, pesticides formulation plants, meat processing plants, revitalization of wells, etc.

Besides distribution of agricultural machinery, the Corporations have also undertaken various other commercial activities. The Maharashtra Corporation has set up a Cattle Feed Factory at Gurgaon and a Poultry Feed Factory at Pimpri. It has also set up plants for the manufacture of superphosphate and NPK granular fertilizer at Rasayani. The Andhra Pradesh, Madhya Pradesh, Tamil Nadu and Mysore Corporations have given particular attention to exploitation of ground water. Land levelling and land reclamation work has been taken up by Corporations in Bihar, Rajasthan and Kerala. The Karnataka, Assam and U.P. Corporations have taken up distribution of fertilizers and other inputs to farmers in their States at reasonable prices. Fruit processing is another field of activity entered into by the Corporations in Assam, U.P. and Andhra Pradesh. The Kerala Corporation has started manufacture of power tillers.

The Government has also set up 13 training cells and two regional coordinating centres at the Tractor Training Centres at Budni and Hissar. These centres impart both technical and theoretical training in agricultural machinery to entrepreneurs. By the end of March 1974, 1174 agro-service centres had been set up and 2,009 entrepreneurs trained, by end of September 1977, 4788 entrepreneurs completed their training and 2,950 ASC were established since the inception of the scheme.

Causes for Slow Progress of Mechanisation

Large scale use of machines in agricultural operations has so far not been very satisfactory for various factors, viz.,

(i) Holdings of majority of the agriculturists are very small, irregular in shape and uneconomic. More than 50 per cent are below

1 hectare. Tractors can be used economically only when the area commanded is at least over 40 hectares. In order to bring farms upto the standards of America and other European countries, the average area of cultivable land allotted per tractor of 20 to 60 horse power, should be between 70 and 80 hectares. For every plot of 200 to 240 acres, 3 to 4 tractors are required and for every plot of 400 to 600 acres, 5 to 7 tractors would be required. Further, as the size of plot increases, smaller number of tractors would be needed.¹

(ii) There is abundant human labour lying idle in the villages. Agricultural labourers are employed on an average for 191 days only in a year : for the rest of the year they are unemployed. Hence, the use of farm machines might aggravate the seriousness of the situation further, unless there is some other source of livelihood.

(iii) The machines are very costly. "The introduction of large scale machinery in family operated farms is prohibited by its high cost in relation to the value of the capital that a farmer can accumulate on the typical small farm of the region. Even a small tractor may be worth five or ten years' wages of the cultivator. He could never pay for it out of the value of one-third more or less, of his product that he sells."²

(iv) There is an acute shortage of kerosene, petroleum and diesel oil. These need to be imported from abroad at a high cost and this leads to a heavy drain on foreign exchange reserves.

(v) There is not only scarcity of machines, there is also a lack of mechanical skill in the country. The farmers are not aware of the use of even simple mechanical appliances because as yet no effective demonstrations by agriculture departments have made their way in the field.

(vi) There is inadequacy of the servicing stations, workshops, fuel supply stations and the supply of spare parts is quite insufficient beside it takes a long time to replace them. Repair and depreciation charges are also very heavy.

(vii) The machines that are got from abroad are either too heavy and cumbersome or too light for difficult Indian conditions. The result is that some machines do not operate with full efficiency and may even damage the soil structure.

Moore has rightly observed, "a deterrent to mechanisation in many tropical regions is the lack of understanding on the part of people how to select, operate and maintain machinery at high level of efficiency. To meet all the machine repairs and difficulties that arise in the normal operation of farm machinery requires considerable training and understanding. Many practically new articles are lying idle throughout. The trailers, broken and unused, because

1. S. C. Jain, *Agricultural Development in India*, 1967, p. 248.

2. *Economic Survey of Asia and Far East*, 1950.

they were attached to too heavy tractors ; on the other hand, many new implements are unused because the farmer has insufficient power."

There are practical difficulties in the way of introduction of the machines on the farms. Some of these can be removed.

First, the Government should provide credit facilities to those farmers who are willing to purchase the machinery individually.

Secondly, joint farming societies may be developed to serve as machinery co-operatives in the different States.

Thirdly, *Machine Stations* of the type of M. T. S. or U. S. S. R. may be developed in different parts to give the tractors and servicing facilities to the cultivators on subsidised rates.

Fourthly, cheaper types of smaller machines suitable for Indian conditions should be evolved. These would help the labourer to perform his task more efficiently rather than displace him. In this connection we would do well to remember what F. A. O. Development Paper has remarked ; "Mechanisation should not be introduced in a hurry, or on a too large scale. To be successful it should be gradually expanded and kept within proficiency standards of those who operate it."

"Special studies should be made of the need for tractor drawn ploughs or other tillage implements, with a view to procurement and use : (i) where the soil areas will yield far greater increases in food production than is possible with other tillage implements, and where the cultivators have the ability, willingness, and organisation to make effective use of the implements without significant subsidy beyond loans ; (ii) where neglected and compacted soils of derelict village commons can be brought into use ; and (iii) where new land development requires heavy initial ploughing or earth moving. Even scarce foreign exchange should be allocated for such machines where the benefits are very substantial."¹

At the outset, it might appear that the scheme of overall mechanisation is not feasible under the present agrarian structure in India, for agricultural sector may not presently invest huge sums of money : and it would be difficult to create big farms required for mechanised agriculture compulsorily. Therefore, the scheme should be extended gradually on the following lines :—

- (i) Complete mechanization should first be extended to the State farms.
- (ii) The vast sub-marginal newly reclaimed areas should be brought under mechanised mechanisation.
- (iii) It should be extended over to such lands where co-operative joint farming societies have been formed.

1. *Report on India's Food Crisis and Steps to Meet It*, p. 155.

- (iv) It should also be extended to the old co-operative farms which have enough areas in compact blocks and have enough scope for mechanisation of agriculture.
- (v) Private big farmers should be induced to adopt mechanisation, "for the use of more efficient equipment is one of the principal ways by which productivity per man and per acre, and 'hence living standards can be raised.'"¹

The Government should also take actions in other directions too like the following :

- (1) Undertake research and investigation on the suitability of different types of machinery for different farming operations ;
- (2) To improve the indigenous implements in order to increase their efficiency and thus give to the Indian farmers improved technology within their reach.
- (3) Undertake experiments on mechanisation of operations with a view to determining their effect on soil conditions so that intensive agriculture could be introduced more effectively.
- (4) Undertake cost benefit studies.
- (5) Provide training facilities to the farmers in the use and handling of farm machines.
- (6) Develop servicing and workshop facilities in the rural areas.
- (7) Encourage cooperative societies for the supply of machines and service facilities.

In conclusion, it may be said that mechanised agriculture is primarily associated with grain farming of an intense nature in Western countries. It has resulted in notable geographic shifts towards relatively level topography, particularly to cheap land of low rainfall in Canada, Australia, Argentina and the western parts of U.S.A. which could not be cultivated economically under more laborious methods."² Such geographic shifts would be desirable in India where there are lakhs of acres of relatively level culturable wastelands. Besides, mechanization can be profitably adopted for the construction of country roads, drainage, and irrigation channels, development of underground water resources, and land reclamation. Of course, the types of machines that will be needed will depend on the nature of the work for which they are to be used. Development of wastelands will require rather heavy types of tractors while arable lands will need lighter types. In this connection we may quote Lamartine and Wariner : "If the first era of agricultural machinery was characterised by the size, the second era on which we are entering appears to be devoted to evolving small

1. F.A.O. *Progress and Economic Problems in Farms Mechanisation*, 1952, p. 5.
 2. *Encyclopaedia of Social Sciences*, Vol. I, p. 156.

machines, for the small men."¹ Hence, for the land development and for annual ploughing on large estate, the tractor is most suitable while stationary oil engines can be used for sinking bore holes, and for water lifting. "Left to its own devices, agriculture is inefficient...It leaves largely unsolved the problems of crop failure and famine. When linked up with industry through mechanisation, it becomes highly efficient, its per man productivity rising to amazing heights."²

LAND RECLAMATION SCHEMES

The schemes are those schemes which are of multipurpose character and cover a wide range of activities. According to Pillai and Panikkar, "These are the schemes which provide not only for drainage and levelling of lands for cultivation or habitation but for linking up and co-ordinating these with the current of water courses, irrigation, road construction, organisation of communications, electricity undertakings, supply of drinking water, sanitation, housing establishment of rural centres, agricultural industries and multitude of other amenities. Thus, *land reclamation has come to be recognised not merely as a measure of land utilisation but as a complex policy contributing to over-all social and economic welfare.*" It is through land reclamation measures that culturable waste lands are brought under the plough.

The land covered with jungles and scrubs cannot be brought under cultivation without the aid of adequate labour and capital. The deep-rooted grasses like *Kans* cannot be eradicated without the assistance of tractors, and the drawing of marshy lands is frequently an expensive operation. Provision of irrigation facilities involves heavy capital outlay and there is a limit to the rate at which open wells and tube wells can be constructed. Due to lack of suitable fencing and fire-arms protection against wild animals presents difficulties. In addition to those, unhealthy tracts provide problems difficult to tackle.

Reclamation of *Kans*-infested Lands

About 4 m. hectares of *kans*-infested land has gone out of cultivation in M. P., Bihar and Rajasthan. Such lands can be rendered free from weeds only by heavy tractors. It is desirable that while breaking up waste-lands ploughing should be done along the contour lines where slopes are more than two per cent.

Secondly, boundary and field embankments should be put on the contours. This will prevent soil losses and at the same time preserve moisture : and the bunds by holding monsoon water will suppress the growth of *kans*.

1. Lamartine and Wariner. *Food and Farming in Post-War Europe*, p. 75.
2. E. W. Zimmermann, *World Resources and World Industries*, 1956. p. 166.

Thirdly, to check the reappearing of weeds after a few years ploughing operation should be done by tractors. Green manuring should also be practised wherever possible.

Fourthly, good plough bullocks should be made available in time so that the broken up land does not become re-infested with *kans*.

Fifthly, individual farmers possessing large holdings may be encouraged to use tractors of 25 or 30 horse power for the "follow up" cultivation.

Reclamation of Saline and Alkaline Lands

There are about 6 million hectares of saline and alkaline soils in the states. They are characterised by high salt concentration or high alkaline reaction. Saline soils can be reclaimed by washing down of salts and flushing out of salts. Heavy irrigation can remove these water soluble salts from the soil surface. This method is possible if there is a natural drainage, large supply of good quality irrigation water and a low water table (say of 1.5 to 2 metres below the surface). In the field to be reclaimed 1.2 to 2 metre deep water is allowed to stand on the surface for a day or so with occasional mechanical stirring after the period it is drained out of the field, thereby removing the maximum quantity of dissolved salts.

Saline soil can also be reclaimed by leaching down the soils to or below a depth of about 3 metres. Washed down to this depth, the salts cannot easily come up if the water table is low, or if there are sand strata in the sub-soil.

Salts accumulated on the saline soil surface could be removed by mechanical scraping with the help of a *karah*. After scraping, farm yard manure at the rate of 15 tons per acre may be applied and ploughed in before sowing crop.

Proper soil management practices can reclaim saline salts. Crops can be grown on the sides of the ridges, salts generally come upto the top and accumulate on the top of the ridges without affecting the growing of crops. This salt can be removed by scraping.

Certain crops are more salt-tolerant than others. Hence, salt tolerant crops can be grown in such soils and the salinity reduced. Sugarbeet, rape and mustard, cotton, barley, berseem, *methi*, castor, rice, salt bushes, trees like *kikar* (*Acacia arabica*), *Jand or khejri* (*Prosopis Spicigeria*), *jal* (*Sulvadora-olleoides*), *palash* (*Dhak*). *Kharir* (*Capparis*) : grasses like *khar usar* (*sporobolus Arobious*), and *usrants* (*Chloris Wrigata*), *dub* (*Cynodon dactylon* and *gandar* (*Andropogon Squarrosus*) can go a long way in reducing the salinity of the soil.

The treatment of soil with gypsum at a rate of the gypsum requirement of soil (3 to 5 tons per acre) followed by flushing with plentiful supply of good quality irrigation water and growing a crop

of *dhaincha* (*Sesbania Aculeata*) as green manure and transplanted paddy, lucerne, sugarcane and wild indigo give marked responses to remove surface incrustations of alkali.

Application of amendments like calcium chloride, sulphur and press mud are also useful.

The operational procedures followed in the reclamation of the land in Punjab, U. P., M. P., Andhra Pradesh, Maharashtra and elsewhere were :

- (i) Initial breaking up and laying out into quarter-acre plots ;
- (ii) Levelling according to contours ;
- (iii) Leaching consisting of flooding, ploughing, reflooding ;
- (iv) Green manuring, *jantar* in *kharif* and *senji* in *rabi* ;
- (v) Raising rice crops in *kharif* and berseem, gram, wheat in *rabi*.
- (vi) In the post-reclamation phase, cotton, sugarcane, oilseed and fodder were grown.
- (vii) Application of farmyard manure to these degraded land to help restoring their productivity.

In the coastal areas, reclamation process of these land comprised :

- (i) Protection of area from sea water,
- (ii) Drainage of the area by means of a system of drain ditches.
- (iii) Provision of adequate inundation of the area to ensure removal of salts by leaching.

Reclamation of Water-logged Land and Lands Rendered Barren by Flood and River Action.

According to the latest available figures, the Punjab is the most affected state with water-logging followed by Maharashtra. Jammu and Kashmir and Delhi ; Punjab (2,500,000 acres), Maharashtra (55,230 acres), J & K (4,500 acres) ; Delhi (3,200 acres)¹ Besides Sutlej and Yamuna Valleys in Punjab are subjected to heavy floods from these rivers. The Yamuna has a low band on the right side for about 100 miles and during monsoon the river overflows the bank causing huge devastation of crops and cultivated lands. In Bihar, annual flooding of rich alluvial land is a regular feature. The Brahmaputra river causes annually extensive flood damage to Assam valley land. In W. Bengal, Orissa and Rajasthan (Hanumanagarh area) serious damage is caused practically every year from floods in rivers. Thus, extensive areas at present are lying waste or are very little utilised because of the devastating floods. These areas along the bank of rivers (of the width of 2.2 to 4 kms.) are very fertile. These areas may be reclaimed for cultivation by the construction of suitable embankments along the rivers.

1. *Study of Wastelands and their Reclamation Measures*, pp. 106-107.

Areas under canal irrigation are getting water-logged, as a result of which sub-soil water level has steadily risen and large tracts of land are going out of cultivation especially in the Indo-Gangetic plains which have flat land and poor out-falls. This problem of surface drainage can be met by planning efficient drainage systems, including channel, improvements and flood control. On the other hand, sub-surface drainage could be improved by means of deep drains, tile drains, shallow tube-wells or by reducing seepage into the under ground reservoir by lining canals. Through proper sub-surface drainage the following benefits accrue¹ :

- (i) It gives the root zone greater depth, which increases the available supply of plant food and moisture.
- (ii) It results in warmer soil and aeration of soil which is conducive to the better growth of plants.
- (iii) It provides physical improvement of the soil resulting in granular structure producing good tilth.
- (iv) It helps in removal of surplus water enabling crops to withstand wet weather conditions.

Introduction of drainage brings about favourable changes in the soil properties such as structure, permeability, moisture availability, air capacity and nutrient availability, all of which influence plant growth. Therefore, tree plantations are cheaper and more efficient in dealing with the swampy lands. Fast growing *eucalyptus* species, *casuarina*, *tamarix*, *ber*, *teak*, mango, *toona*, *terminalia*, *acacia*, *prosopis*, and among grasses *para*, *dallis*, *najper* and *guinea* grass for fodder purposes), *korai* and *murta* (for preparing mats) and *muja* for thatching, may be profitably planted.

Crops of economic importance, which can tolerate varying degrees of water-logging, are given below.²

Extent of water-logging	Field crops and vegetables
I. Prolonged flooding (a) deep water (b) shallow water	Rice (deep water paddy) water chestnut, waterlily, paddy.
II. Flooding in later stages of crop growth	Paddy, jute, sugarcane.
III. Wet soil but occasional stagnation of water or no stagnation of water	<i>Dhaincha</i> and Arvi.
IV. High water table occasion- ally rising to ground surface	Paddy, jute, sugarcane, <i>dhain- cha</i> and Arvi

1. *Ibid.*, p. 118.

2. *Ibid.* p. 142.

Reclamation of Torrent-Ruined and Desert Lands

It has been estimated that in all about 200 m. acres (70 m. hectares) of land—affected from ravages of soil erosion—needs protection by soil conservation measures. Such areas exist along the rivers in the states of M. P., U. P., Rajasthan, Bihar, Orissa and Gujarat. Such lands can be reclaimed by a simple type of afforestation, controlled grazing, terracing and other soil conservation measures like contour cultivation, strip-cropping, proper crop planning, construction of dams and bunds.

The Great Indian desert, which encompasses the western half of Rajasthan (covering 11 districts of Bikaner, Jaisalmer, Barmer, Jodhpur, Nagaur, Churu, Pali, Jalore (these 8 form the “core” of the desert) Ganganagar, Jhunjhunu and Sikar) and extends over parts of Gujarat (including parts of Mehsana and Banaskantha districts) and Haryana (covering Bhiwani, Hissar and parts of Rohtak districts) covers nearly 234,895 sq. km.¹ It is spreading at the rate of $\frac{1}{2}$ mile (0.8 km.) per year for the last 50 years and its encroachment upon approximately 50 sq. miles (13,000 hectares) of fertile land every year. These desert areas need early re-habilitation.

Till recently, no efforts were made to reclaim deserts on the universal belief that land plants must have fresh water to survive. But experiments carried out by Israeli scientists have shown that some desert soils irrigated with sea and brackish ground water can grow valuable food crops such as barley, potatoes, wheat and maize. In the Negev Desert at Elath on the northern shore of the Red Sea, where the annual rainfall is less than one inch and the soil consists mainly of the stones and sand, some 180 species of plants generally thought to need fresh water were tried solely under saline water irrigation and the plants survived.

The scientists attributed their success to coarse soil with low clay content—the type of soil often found in deserts. Water placed on such soil rapidly percolates and disappears in a matter of minutes, but the brief period during which it passes through the root area gives the plants enough time to absorb all the necessary nutritive elements without allowing the harmful sodium and magnesium salts time to damage the roots. It was also noticed that these plants were more tolerant to salt if the soil consisted mainly of sand or gravel, and the plants irrigated with saline water were able to withstand a drought period of some nine months whereas the same species irrigated with fresh water died after a short period of water deprivation.

1. Rajasthan ; all eleven districts, 208,626 sq. km ; Haryana (Hissar : 11,393 sq km ; Bhiwani : 4,011 sq km ; Rohtak : 2,107 sq km), 17,511 sq km ; Gujarat (Banaskantha : 6,841 sq km ; Mehsana 1,917 sq km), 758 sq. km. National Planning Commission on Agriculture, Interim Report on *Desert Development*, 1974, p. 11.

To meet the threatening scarcity of water, scientists have mostly been concerned with methods of changing the relationship between the water in the hydro-sphere and that in the atmosphere. Research workers at the Hebrew University, Jerusalem, have conceived the alternative idea of trying to decrease the water requirements of cultivated crops.

A single ton of hay absorbs 500–1,000 tons of water in one growing season, but only a little is retained (one part in 500 to 1,000). For more irrigation water passes from the soil to the air through the plants than is lost by direct evaporation from the soil. Recent tests have shown that transpiration of such massive quantities of water is not vital for plant growth or survival. Preliminary results of experiments indicate that under adverse conditions of high temperature and low atmospheric humidity, the water requirements of various crops such as beans and grapes may be reduced. Treatment with anti-transpirant has increased unirrigated grape yields by as much as 15 percent.

Polythene sheets have also been used for collecting and concentrating occasional showers. Showers are normally just sufficient to wet the soil but soon evaporate in the heat. When water from a large area is led to a small pit and concentrated on the roots of plants, it can contribute to effective growth. It can also help wash the accumulated salts from the soil.

A lot of water provided for irrigation is lost by evaporation while in storage and transport. Occasions come when such losses exceed the amount up to actual use. Therefore, if efficient means of preventing these losses could be found, the available supply might be augmented. Experiments have shown that evaporation from storage tanks and reservoirs can be reduced by using one molecule thick layer of certain alcohols on the water surface. Although efforts are still on to solve the problem of wind and wave action which tends to push this thin film to one side, a 20 to 30 per cent reduction of evaporation has already been achieved in field tests.

Efforts are afoot in India to prevent the growth of arid areas and to reclaim the barren desert of Rajasthan. For the stabilization of sand dunes, Esso has developed 'a sand dune stabilization oil' which has been tried out successfully in Libya, Tunisia and other areas. The spraying of this oil prevents sand movement and stabilizes the dunes for young tree seedlings to become established. The saplings in turn provide their own wind protection their roots binding the soil and the leaves providing the much needed humus.

Esso has also developed an 'agricultural mulch' which directly influences two soil environmental factors—the soil's temperature and moisture content—factors which are essential to vigorous plant growth. The mulch, which is a liquid spray derived from petroleum forms a low porosity black, film placed directly over seed beds. The black film absorbs a high proportion of incident solar radiation

resulting in increased seed zone temperature (up to 40 degree F. higher than that of bare soil), helpful for the early germination of seeds.

Also, since the mulch forms a continuous film, evaporation of moisture from the seed zone is retarded, thereby conserving moisture. Both these factors greatly enhance plant response. Additional benefits of mulch include protection of soil against the erosive forces of nature, and reduction of the rate of leaching of soil nutrients and chemicals. Tests carried out with this mulch have shown remarkable results, raising the output of such garden crops as carrots, onions, sugar beets and cancaloupes from 10 to 60 per cent. The mulch shows great promise in areas of marginal rainfall in India.

The National Commission on Agriculture has recommended the following measures for rehabilitation of the desert areas.¹

(i) To check further deterioration of the desert, digging of *phog*, which accelerates wind erosion and dune formation should be discouraged.

(ii) Pasture development, regulated grazing and creation of grass reserves should constitute an important programme of the rehabilitation of the desert. Rotational grazing and grass reserves should be planned in fairly large blocks, each of a minimum of 200 hectares.

(iii) All shifting dunes in the canal command area, along Rajasthan canal (on land varying width upto 300 metres), should be stabilized by planting over with grass and trees to prevent sand casting on arable land. Grazing of livestock on these dunes should be restricted so as not to disturb the soil.

(iv) In other cultivated areas suitable shelter belts and wind breaks should be established to minimise the desiccating effect of hot winds and reduce sand casting.

(v) A programme of reclamation of saline lands in the 'tal' areas in the command of a channel should be put through during the first few years of irrigation development when there would be spare water.

(vi) A programme of tree growing on the sides of main canal, branches and major distributories should be implemented on a priority basis.

Reclamation of Degraded Forest Areas

There exists a large hecfrage of degraded forest areas or areas under grasslands which need reclamation. In such areas, soil fertility can be maintained by adopting suitable cropping patterns. Soil fertility can also be regained by growing green manuring crops. Afforestation of wastelands can be done with a view to improving the productivity of such areas and arresting their further deterioration. Soil characteristics of wastelands, viz., shifting sand dunes in desert areas, skeletal and rocky soils, denuded hill

1. National Commission on Agriculture, *Op. Cite.*, pp. i—v.

slopes, heavy black soil with or without *kankar pans* will decide the plant species to be grown. The wastelands which may be economically reclaimed for agriculture should be utilised after reclamation for crop production with adequate soil conservation measures and most of the other wastelands should be afforested with quick growing fuel plantations.

Possibilities of Future Extension of Cultivated Area are Dim

In brief, it may be said that the possibilities of bringing fresh land under cultivation are very limited partly because the area of culturable waste land is very limited ; and partly because it is a very costly affair requiring huge capital, and technology which are at present lacking. Besides, the depletion of land resource under a heavy pressure of population, is rendering the land resources position more precarious. Further, land utilisation can be more extensive in newly settled and sparsely populated countries of the world like Canada, U.S.A., Siberia, Australia, but in old densely populated countries of China, India and Japan, where adjustment to physical environment has been accomplished through centuries and the pressure of growing population has exhausted the use of all land usable, the pattern of land use is mostly determined by the physical capabilities of land and the application of modern scientific and engineering techniques. In these countries, the possibilities of increasing production from farm land lie much more in the direction of improved agricultural forest or pasture management techniques in attempting a more intensive land use pattern.

Progress of Land Reclamation Work

Prior to 1946, no attempts were made to find out the extent of cultural wastelands that could be reclaimed. However, the Bengal Famine Enquiry Committee, 1945 and the findings of the Food Grains Policy Committee of 1947 drew pointed attention towards this problem. The latter Committee recommended that 3 m. tons of additional food grains could be obtained by reclamation of 9 m. acres of weed-infested and jungle lands. The matter received consideration and the availability of 300 tractors left by the U.S.A and other Allied Governments gave a spurt to the land reclamation programme.

The scheme of land reclamation had to be undertaken both by Central and the State governments through the Central Tractor Organisation and the State Tractor Organisations. The C.T.O. was entrusted with the reclamation of *Kans*-infested lands and jungle—clearance of lands offered for such operations by the State Governments on 'a no-profit no loss' basis. The S. T. O. was to undertake the reclamation of Government wastelands for allotment for cultivation to private parties, private uncultivated lands already occupied, whose owners required help for reclamation of lands for new or more intensive cultivation.

The C.T.O. started operation in 1947-48 with about 200 old tractors (purchased from the American Army Disposals) and it was

aimed at reclaiming 2.6 m. acres of wasteland within a period of 5 years. During 1948, more than 4 lakh acres of land spread over Bihar, U.P., M.P., Assam, Madras and Punjab were reclaimed for cultivation. By the end of June, 1949, the C. T. O. reclaimed over 70,000 acres of weed-infested land. The scheme was confined to blocks with an area of 10,000 acres and above only.

During the First Plan, the C. T. O. reclaimed 11.86 lakh acres of land compared to the targets of 11.1 lakh acres, Jungle clearance was undertaken in U.P., Bhopal and Assam. The C. T. O. had to be wound up as the State Governments wanted the reclamation by tractors to be carried on by themselves instead of paying the C.T.O. Besides, heavy cost of repairing the tractors was also responsible for winding up.

The S. T. O. reclaimed lands in U.P., Maharashtra, Tamil Nadu, Assam and Bihar.

In U.P. there are four main colonisation schemes : Ganga Khadir in the Meerut District (where a jungle covered tract of nearly 55,200 acres has been cleared and sown) ; Tarai and Kashipur in the Naini Tal district (where nearly 50,000 acres of useless land have been brought under the plough) ; and Dunagiri in Almora district. Three more areas, namely, Manunagar in Rampur district, Bharasar in Garhwal district and north Afzalgarh in Bijnor district were also selected for settlement. Besides, on 16,500 acres farm was established in the Tarai area by the State Govt. In these areas, lands have been allotted to agricultural graduates, political sufferers, landless labourers and displaced persons from Pakistan.

In formation of its schemes for development and settlement of new areas, the U.P. Government had kept three objectives in view ; (i) extension of cultivation to culturable waste lands available for reclamation in order to help in the solution of India's food problem. (ii) settlement of certain classes of people who could not easily find gainful employment in the existing rural economy of the State, and (iii) promotion of application of improved agricultural techniques both in the technological and organisational spheres.

Various difficulties had to be encountered before the land could be used for cultivation. Heavy clearance and reclamation operations had to be undertaken ; means of communication had to be improved through the construction of roads and culverts, and loans had to be given to the colonies for construction of pucca houses, and drainage system had to be improved and anti-malarial operations had to be undertaken through an anti-malarial organisation set up specially for the purpose.

In the erstwhile State of Bombay, reclamation of *Khar* and *Khajan* lands was undertaken in some of the coastal districts which suffered from encroachments from sea-waters on agricultural lands. A *Khar Lands* Development Board was set up with the aim of reclaiming 125,000 acres of land in the districts of Thana, Kolaba,

Ratnagiri, Broach and Surat. In all 68,000 acres of land were reclaimed during the First Plan period by improving land through anti-malarial measures, establishment of gun-clubs, clearance of superfluous forest growth and provision of drainage facilities.

In Tamilnadu, 188,540 acres of private and Government wasteland was reclaimed ; while in M.P. the area reclaimed totalled about 205,000 acres by the end of the First Plan period.

Land Reclamation Work Under the Plans

During the *First Plan* a total area of about 2.06 million hectares was reclaimed by the Central and State Tractor Organisation and by private parties against a total target of about 2.87 m. hectares.

The target for reclamation in the *Second Plan* was 0.61 m. hectares through the Tractor Organisation against which 0.93 m. hectares were reclaimed.

The target laid down in the *Third Plan* under both State Government schemes and the Centrally sponsored scheme of reclamation of wastelands and resettlement of land envisaged reclamation of 1.46 m. hectares which included some minor land levelling work of 0.8 m. hectares in the command area of Rajasthan Canal Project. Against this target, till the end of March 1968, a total of about 2 m. hectares was reclaimed.

In the *Fourth Plan*, reclamation of land for agricultural use was given a lower priority than quick-growing programmes like minor irrigation, high yielding variety, application of fertilizers, etc.

Schemes for reclamation, and development of land in assured rainfall areas are implemented by the different State Governments with financial assistance from Agricultural Refinance Corporation.

Animal Husbandry, Dairying and Fisheries

Magnitude of Cattle Population

India has diverse physical and climatic conditions and natural vegetation. Naturally, a varied and rich fauna is met with in India. There are about 500 species of animals and 3,000 species of birds. Some of them have been domesticated so as to get various benefits from them. Others are included in wild life.

In India, according to 1972 livestock census, there are 17.8 crore cattle, 5.8 crore buffaloes, 6.8 crore goats and 4.0 crore sheep. It thus possesses 21 per cent of the world's total cattle population, 18 per cent of the world's goats ; 4 per cent sheep and more than half the buffaloes. India possesses nearly 11 per cent of the total livestock population of the world. The following table gives the live-stock statistics in India.

Livestock population in 1945-1972. (In 000)

Category	1951	1956	1961	1966	1972
Cattle	155,099	158,651	175,557	176,057	178,865
Buffaloes	43,351	44,916	51,211	52,920	57,941
Sheep	38,829	39,246	40,223	42,014	40,395
Goats	47,077	55,405	60,864	64,566	68,024
Horses & Ponies	1,514	1,483	1,327	1,149	966
Mules	60	40	53	75	76
Donkeys	1,239	1,055	1,096	1,054	996
Pigs	4,420	4,932	5,176	4,975	6,900
Camels	629	776	903	1,028	1,126
Others	--	—	22	30	12
Total livestock	292,218	306,504	336,432	343,868	354,982

Distribution and Density of Bovine Population

Largest numbers of cattle are found in U. P. which possesses about 15 per cent of the total, followed by M. P. (14 per cent) Bihar

(9.2 per cent), Maharashtra (8.8 per cent), Rajasthan (7.5 per cent), A. P. (7.3 per cent), West Bengal (6.5 per cent), Tamil Nadu (6.2 per cent) and the rest of the States. Orissa, Karnataka, Gujarat, Assam, Punjab and Himachal Pradesh contribute 25.7 per cent of the total.

As regards buffaloes, about 21.5 per cent of the country's total are found in U. P. followed by Andhra Pradesh, M. P. Punjab. Rajasthan, Bihar, Maharashtra, Karnataka, Gujarat, Tamil Nadu and other States.

Relative densities of bovine population in different states reveal that density of cattle per 100 hectares of gross cropped area is the highest in Maharashtra and Gujarat with 280. This is closely followed by Himachal Pradesh, Assam, J and K, West Bengal and Orissa with 279, 267, 241, 118 and 162. Rajasthan, Delhi, Punjab and Haryana show low densities, having only 96, 92, 74 and 58 respectively. For the country as a whole, the density works out to 116 cattle per 100 hectares of gross-cropped area.

In the distribution of cattle per unit of human population, the average for the country comes to 400 cattle per 100 persons. Among the states Himachal Pradesh has 90, followed by M. P., Rajasthan and Orissa with 76, 65 and 56 cattle per 100 persons. In the case of buffaloes, the density per unit of gross cropped area is the highest in Andhra Pradesh with 57 buffaloes per 100 hectares. J. and K. Delhi, U. P., Himachal Pradesh and Punjab support 53, 50, 50, 48 and 45. In West Bengal and Orissa the density is the lowest, being 16 and 18.

The density of buffaloes per 100 persons is highest in Punjab with 22 buffaloes. Rajasthan, Andhra Pradesh, M. P., U. P., and Himachal Pradesh follow with 20, 19, 17, 15 and 15 buffaloes respectively. The all India average density works out at 34 buffaloes per 100 hectares of gross cropped area and 100 buffaloes per 100 persons.

Working Animals : (a) Working Bullocks

Of the total working animals in India, roughly 87.0 per cent are bullocks, 9.0 per cent male buffaloes : 3.0 per cent cows and 1.0 per cent she-buffaloes. Thus cattle constitute about 90.0 per cent of the work animals. Even on the basis of males only, the proportion is not much different, there being roughly 91.0 per cent oxen and 9.0 per cent buffaloes.

The proportion of working bullocks is greater in U. P., followed by Bihar, Maharashtra, Gujarat and Punjab. These states grow mostly wheat, cotton or sugarcane, on which bullocks often feed. On the other hand, this proportion is low in Rajasthan because of sandy soil ; Himachal Pradesh and Jammu and Kashmir, because of hilly and forested lands ; and Kerala, Karnataka and Assam, which grow rice, jute and tea. On the whole, working bullocks form about

46 per cent of the total cattle population in the country, India has 73.3 m. working bullocks.

(b) Breeding Cows

In so far as India is essentially a farming country, the importance of efficient cattle for the stability and prosperity of the zones can scarcely be exaggerated. The number of livestock has an important effect both on the total output of agriculture and on the farm in which the output appears. Cattle play a very important part in Indian agriculture. "But unlike in other countries of the world, whose cattle are maintained mainly for milk and meat, in India these are primarily kept as draught animals for the plough or cart as the camel, the horse, the donkey and mechanical vehicles are rarely used. Without them no cultivation would be possible, without them no produce can be transported." Cattle supply the most important motive power for almost all agricultural operations such as ploughing, lifting water from the wells, and the transport of produce from field to the markets. Their share in the total inputs in crop cultivation is from 8 per cent to 42 per cent.

The milch cattle, 96 per cent of the cows and 94 per cent of the she-buffaloes were located in rural areas and only 4 per cent of the milch cattle and 6 per cent of the she-buffaloes were found in cities and towns in 1971.

Variations in the number of cattle from state to state are due to climate, grazing facilities, and the area under fodder crops which determine to a great extent the quality of cattle and the carrying capacity of the land. Agricultural development, introduction of irrigation and land reclamation project affect adversely the livestock as the land available for grazing is reduced and the cultivated area under fodder and feed crops does not increase correspondingly, resulting in the reduction of total livestock feed.

(c) Unserviceable Stock

These comprise old and enaciated animals which are permanently unfit for work or breeding, but nevertheless are kept by their owners, mainly on religious or sentimental grounds. The total number of such animals is 29 million, or 12 per cent of the total cattle in the country.

(d) Other Animals

As regards other animals, nearly 60 per cent of sheep are almost equally distributed in the three states of Rajasthan, Andhra Pradesh and Tamil Nadu, and rest is distributed over Maharashtra, Karnataka, U. P. and other States.

Of the goats, a little more than 50 per cent are found in Rajasthan, Maharashtra, Bihar and U. P., the rest being found in M. P., Karnataka, Gujarat and Tamil Nadu.

About 65 per cent of horses and ponies are found in U. P., Madhya Pradesh and Maharashtra.

Mules are found mainly in U. P. and Punjab, camels in Rajasthan and Punjab and donkeys in U. P., Rajasthan and Maharashtra.

In the following table is given the distribution of cattle and buffaloes according to age and sex :

Age and sex of cattle and buffaloes (In 000)

Cattle Year	Males	Females	Young Stock	Total
Cattle				
1951	61,759	49,848	43,492	155,099
1961	72,528	54,204	48,825	175,557
1966	73,330	54,693	48,044	176,057
1972	74,625	56,773	47,467	178,865
Buffaloes				
1951	6,778	21,842	14,731	43,351
1961	7,684	25,023	18,504	51,211
1966	8,192	26,144	18,584	52,290
1972	8,116	29,553	20,272	57,941

Importance of Cattle in National Economy

In so far as India is essentially a farming country the importance of efficient cattle for the stability and prosperity of the rural zones can scarcely be exaggerated. The number of livestock has an important effect both on the total output of agriculture and on the farm in which the output appears. Cattle play a very important part in Indian agriculture. "But unlike in other countries of the world, whose cattle are maintained mainly for milk and meat, in India these are primarily kept as draught animals for the plough or cart as the camel, the horse, the donkey as mechanical vehicles are rarely used. Without them no cultivation would be possible, without them no produce can be transported."

Cattle supply the most important motive power for almost all agricultural operations such as ploughing, lifting water from wells and the transport of produce from field to the markets. Their share in the total inputs in crop cultivation is from 8 per cent to 42 per cent. Cattle are given much importance in Indian agricultural economy. Quality and quantity of cattle not only raise the social status of the Indian farmer but improve his economic condition materially. Thus, in India without cattle, fields remain unploughed, stores and bins stand empty, and food and drink lose half their savour for in a vegetarian country what can be worse than to have no milk, butter or ghee.

Cattle provide us with milk and milk products. India produced about 23.20 lakh tonnes of milk in 1974-75, of which cows provide a little less than half and buffaloes a little more than half. Of the

total production of milk, about 53 per cent comes from buffaloes, 43 per cent from cows and 4 per cent from goats and sheep. India produces about 6 per cent of the total world milk production. Milk and Milk products contribute about Rs. 6,200 million to the national income.

Cattle also provide meat. About 75 per cent of the meat produced is that of sheep and goats. Beef and pork account for only 6 per cent and 4 per cent respectively of the total. The total production of all types of meat is estimated at 0.49 m. tonnes valued at Rs. 1,000 million. About 0.9 per cent of the cattle, 36 per cent of the goats, and 33 per cent of the sheep population is slaughtered annually.

Cattle also provide us with the farmyard manure which promotes the productivity of the soil. The cattle dung annually available amounts to about 1200 million tons (net weight) of which 400 million tons are used as fuel and 215 million tons as manure, the balance being wasted. On the basis of energy content, 400 million tons of dung is equivalent to 46 million tons of coal. One cow usually provides with 122 mds of dung and 40 mds. of urine per year. This cow dung is being used in gas plants which enable extraction at a lower cost of sufficient gas as a combustible material.

Cattle serve in transport too. In the words of the Royal Commission on Agriculture, "In most parts of the world cattle are valued for food and milk ; in India their primary purpose is draught for the plough and for the cart...." It is obviously difficult to place a definite monetary value of cattle labour. 300 to 500 crores of rupees, however, are assessed to be the value of cattle labour in India.

Miscellaneous products such as hides and skins are also an important source of income from cattle. India produces about 32 per cent of the world's hides and skins. The total production of cattle hides is 16 millions and buffalo hides 5 millions while goats' skins amount to 21 millions and sheep's skin, 16 millions.¹ They provide 36 m. kgs. of wool, about one half of which is exported as carpet wool.

The total annual production of animal fats and other by-products is estimated to be 0.24 m. tons. From the exports of tallow, animal castings, cattle tail hair, horns and hoofs and horn, and hoofmeal, India gets about Rs. 6 m. per year. The annual availability of raw bones is about 3.6 lakh tons approximately valued at about Rs. 8 crores.

Animal husbandry accounts for only 14 per cent of the total income from agriculture sector and its contribution to the national income does not exceed 6 per cent.

1. Randhawa, M. S., *Agriculture and Animal Husbandry in India*.

Gross and Net Value of Output in Agricultural Sector

(In million rupees at 1960-61 prices)

	1960-61		1964-65		1970-71	
	Gross	Net	Gross	Net	Gross	Net
Agriculture	72,554		81,811		108,610	
Animal		65,740		71,982		90,598
Husbandry	12,090		13,225		17,173	
Total Agri.						
Sector	86,828	67,827	97,260	74,105	129,185	93,820
National						
Income		141,400	167,100			241,300

(Source : Planning Commission, *Material and Financial Balance*, 1966. p. 9)

Thus, it will be observed that cattle play a very important part in the national economy. Various estimates have been made regarding contribution which cattle make to the nation. The estimates range from Rs. 1,010 crores (calculated by Dr. Wright) to Rs. 1,200 crores (Sir Datar Singh) and to Rs. 3,470 crores (Srinivasan's estimate).¹ According to the Planning Commission, despite large cattle population the net value of livestock products amounts to Rs. 670 crores or about 16 per cent of the income from agriculture. A recent estimate puts the contribution of cattle products to national income at Rs. 1174-65 crores. Of the total income from animal husbandry, 64.5 per cent is contributed by milk and milk products; cattle manure, 9.7 per cent fuel, etc. 9.7 per cent; meat and meat products 7.9 per cent; hides and skins 2.5 per cent; hair and wool 1.1 per cent; egg and poultry 2.4 per cent; bones 0.1 per cent and increment in stock, 2.1 per cent.²

Despite their important place in the economy and their large numbers, the net contribution made by India's animal wealth is not much. Its share in the country's national income is comparatively small. For example, nearly 42 per cent of national income is accounted for by agriculture in India and the contribution of livestock to the gross agricultural income is barely 15 per cent. In the case of foreign countries, e.g. in Denmark 83 p. c. constitutes the livestock's share of agricultural income, which forms only 16 per cent of the national income. In Sweden, the livestock's share is 80 p. c., in U. K. 78 p. c. and in West Germany 71. p. c. as against 6 p. c., 4. p. c. and 8 p.c. contribution by agriculture to national income.

The reasons for meagre contribution of livestock to national income are :

1. Srinivasan, N. S., *Cattle Wealth in India*, 1953.
2. *Khadi Gramodhyog*, Vol. 10. p. 294.

(i) Use of livestock in the country is anything but economic. The large cattle population contains a sizeable proportion of aged animals, both male and female, which are capable neither of work nor of yielding milk. These animals are clearly a drain on available resources and a drag on the farm economy.

(ii) Cows kept for milk have extremely low yields and according to some estimates, over 90 per cent of these animals yield not more than a kilogram of milk a day.

(iii) Physiological factors like late maturity and parturition and delayed oestrus cycle, resulting in long calving intervals, further incapacitate the female species from becoming more productive.

(iv) In rural India livestock is preferred more for the work they do on the farm than for milk. The small and fragmented holdings typical of the Indian rural scene, necessitate the maintenance of too many animals for farm operations which is far from economical for farm business.

(v) There is also evidence of a high death rate, due to deliberate neglect, particularly among young stock, a good proportion of which could have been saved for purpose of meat for human consumption or for export.

(vi) Besides, except in a few pockets in the country like parts of Punjab, Western U. P., etc., the cropping pattern has not been adjusted to accommodate the fodder and other requirements of livestock. These have resulted in too large a herd as compared to local needs and resources, their widespread neglect as the easy course of stock control and the inevitable low productivity resulting therefrom.

Cattle Breeds

There are as many as 14 well-defined milch breeds of cattle, 12 of draught cattle and 6 well-defined breeds of buffaloes in India. A few of the breeds are of dairy types, in which the females yield a large quantity of milk, while bullocks are not of high quality. A large majority of the breeds are of draft type, in which cows are poor milkers, but bullocks are superior in quality. In between there are a number of breeds which are of *dual purpose*, in which the females yield more than an average quantity of milk, while the males are good working bullocks. These well-defined breeds are found in the dry parts of the country. Outside these areas, the cattle are "non-descript" and do not belong to any defined breed. Broadly, speaking, Indian breeds of cattle are :¹

(a) **Milch Breeds.** Cows are high yielders and bullocks are of moderate type or of poor draft quality. The animals are generally ponderous in build, with pendulous development and sheath, and

1. Randhawa, M. S., *Agriculture and Husbandry in India*, 1958.

having lateral and often curled horns. The *Gir*, *Sindhi*, *Sahiwal*, *Tharparkar* and *Deoni* are some of the outstanding breeds of this group.

(b) **Dual Purpose Breeds.** Cows are fairly good yielders of milk, and the bullocks are good for draft purposes. In this group there are two types of cattle, viz. :

(i) Short-horned, white or light grey cattle with long coffin shaped skull and face slightly convex in profile, e.g., *Hariyana*, *Ongale*, *Gaolo*, *Rath* and *Krishna Valley*, etc.

(ii) Lyre-horned, grey cattle, deep bodied with wide forehead, prominent orbital arches, flat or dished-in profile, and good draft capacity, e. g., *Tharparkar* and *Kankrej*.

(c) **Draft Breeds.** Cows are poor milkers but bullocks are excellent draft animals. In this group there are four types of cattle, viz.

(i) Short-horned, white or light grey cattle with long coffin-shaped skull and face, slightly convex in profile, e.g., *Nagori* and *Bachaur*.

(ii) Lyre-horned grey cattle with wide forehead, prominent orbital arches, flat or dished profile, deep body and powerful draft capacity, e.g., *Kathiawar*, *Malvi* and *Kherigarh*.

(iii) Small black, red or dun cattle, often with large patches of white markings, found in the rugged mountainous areas of the Himalayan region or at the foot of the hills. They have tight sheaths and are either short-horned or slightly lyre-horned. They are useful only for light ploughing and miscellaneous work. The *Porwar* and *Siri* are notable.

Tracts Known for Cattle Breeding

The concentration of a large number of cattle is no index to the production of milk or higher standard of agriculture. Good breeds of cattle are confined to comparatively dry areas such as *Hariyana*, *Punjab*, *Rajasthan*, *Gujarat*, *Madhya Pradesh* and in such parts of other States where similar conditions exist. Pasture in these dry areas may be good in quality but is often scarce and the uncertainty of rainfall makes it obligatory on the part of owners to grow crops, the residue of which provides a good supply of fodder for cattle. Conversely, in tracts with a humid climate which are subject to heavy rainfall or are provided with ample irrigation a very poor type of cattle is found in spite of the availability of grazing.

It is a well-known fact that in rice-growing tracts, cattle are generally found to be greatly deteriorated, both as regards their physical development and capacity for work and milk production. They are also more prone to disease, and reproductive defects are

common to them. In these areas the cattle being inefficient, the number of cattle required for agricultural purposes and for milk production is necessarily larger, even 3 to 4 times as compared to that of other areas where good cattle exist. The larger the number of cattle greater is the strain on the available pastures which results in their further deterioration, thus producing a vicious circle. In Kerala where cattle are of mongrel, non-descript type and where there are no recognised breeds, cows are notoriously poor milkers. The bullocks are puny and weak and on this account cultivators are generally unable to adopt and make use of modern, efficient and labour-saving implements.

Buffaloes thrive best in the areas of moderate heavy rainfall as they require plenty of water for their daily bath. They are dual-purpose animals useful both for milking as well as draught. They live on coarser grass and even then they are heavy yielders of milk, *Murrah* buffalo of the Punjab has an average of 180 kg of milk per lactation period while the better types may yield as much as 2250 kg. The *Rohtak* breed are also famous for milk. The *Kathiawar* or *Zafarbadi* buffaloes are large in size and the daily yield of milk is 15 kg. *Deccan* breeds are more serviceable for heavy cartage but they are poor milkers. The buffaloes are better cared for because they are the more important milk cattle. Her milk is richer, containing as it does from two to three per cent more butter fat than that of ordinary cow, and supplies the major part of the demand for milk. She is more profitable to maintain, as she possesses a remarkable ability to convert coarse fodder into milk. Male buffaloes, after castration, are used for heavy transport as well as for ploughing.

The following *nine breads of cattle, from all parts of India, are of first rate importance* :—

Sindhi. This breed hails from Sind, but several pedigree herds of it have been established in India, particularly in Kathiawar on the west coast. It is a distinctive dairy animal. Pedigree herds are found in Karnataka, Tamil Nadu, Kerala, Orissa and Punjab.

Sahiwal. Though originally belonged to central undivided Punjab, it is available in Karnal, Uttar Pradesh, Madhya Pradesh, Bihar and Delhi.

Hariyana. The home of the breed is the area covered by the districts of Rohtak, Hissar, Gurgaon, part of Karnal and the Delhi State. This breed is also produced in more or less pure form in Jind, Karnal, Hissar, Gurgaon, Delhi, Nabha and Patiala; Jaipur, Jodhpur, Loharu, Alwar and Bharatpur districts of Rajasthan and in east Uttar Pradesh.

Murrah. The cows of this breed are good milkers and the bullocks are excellent for draught. It is available in southern Punjab, Delhi, and northern Uttar Pradesh.

Gir. The home of this breed is Kathiawar (Saurashtra). Pure specimen of this breed is available in Junagadh, western Rajasthan, northern Maharashtra and Gujarat.

Kankrej. The home of this breed is the country to the south-east of the Rann of Kutch, extending from the south-west corner of the Tharparkar district in Sind to Dhola in Ahmedabad district, also along the Banas and Saraswati rivers. It is one of the heaviest of Indian cattle.

Tharparkar. Coming originally from the arid semidesert tracts of south-east Sind, this breed is mostly bred in India today to the north-east portion of Maharashtra and western Rajasthan and Kutch.

Kangayam. The name of this breed is derived from the Kangayam division of Coimbatore district where it has been in existence for a long time.

Ongole. The home of this breed is Nellore and Guntur tracts of the Andhra Pradesh. It is also found in Narasaraopet, parts of Bapatla and dry talukas of Krishna and Godawari districts.

Some of the exotic breeds, which are heavy milk yielders have also been developed in India. The most important of these are Gurnsey, Jersey, Holstein—Friesian, Ayreshire, Brown Swiss, and German Fleckvich.

It is a significant fact that *good cattle are generally found in dry areas and inferior cattle in areas of heavy rainfall*. The rainfall map of India more or less coincides with her cattle map.

The, Punjab, Rajasthan, Gujarat (Saurashtra), Karnataka and drier parts of Maharashtra and Tamil Nadu are homes of some of the best cattle in India, while non-descripts are found in areas of heavy rainfall, like Assam, Bengal, Orissa and Malabar Coast.

Present Position of Cattle in India

In view of the great importance of cattle in Indian agri culture their present position is deplorable. Malnutrition is perhaps the greatest single factor responsible for the degeneration of cattle to their present state. Promiscuous mating, improper and insufficient care, ignorance and lethargy of the people are some of the atrocities which are responsible for degeneration. The causes of their deterioration in the condition may be discussed under the following heads :

- (i) Lack of adequate and proper fodder supply.
- (ii) Want of proper care.
- (iii) Lack of good breeding stock.
- (iv) Diseases and pests.

1. **Lack of Adequate and Proper Fodder Supply.** The majority of the Indian cattle are seriously underfed, particularly the cows in

rural areas. In India stall feeding is rare and the grazing and the grasslands the Indian cattle are seriously underfed, particularly the cows in rural areas in the country are hopelessly overstocked. "Owing to the increase in the requirements of the food for human population, areas, where grazing was possible, have steadily diminished. Large numbers lead to poor feeding and come in the way of attempts to raise productivity. There is thus a vicious circle which it is difficult to break."¹ The natural grazing lands are usually to be found within the areas classed as 'forests', 'cultivable waste' and 'not available for cultivation.' But forests, as a source of fodder supply, are of limited value due to stringency of the forest laws and the policy of enclosure. Cultivable wasteland though another source of fodder supply, is useless for grazing purposes because it does not produce any useful herbage. Similarly, a very large portion of the land marked as 'not available for cultivation' is not useful for grazing because it is absolutely barren. Hence, natural grasslands are utterly lacking.

Over the greater part of India there is an acute shortage of fodder from December to July and the cattle are reduced to mere bags of bones. By this time the insufficient supplies of stored fodder become so much depleted that the ration of the cattle of the poor farmers undergoes serious diminution. Even in ordinary years farmers feel the pinch in the months of May and June. The starvation of this period cripples the cattle, makes the cow an irregular breeder which reduces her natural milking qualities until she is unable to suckle a healthy calf that leads to scarcity of good bullocks, and creates the urge which covers the village grazing grounds of India with useless and decrepit cattle.

Fodder is limited to the dry stalks of jowar and maize and to the *bhusa* (in silo-pit) produced in the cold weather cereals, to which must be added the weathered grasses of the waste lands. Grains and pulses are little used as cattle food. Within this period falls the season of maximum demand for power, for agricultural purposes, for thrashing, ploughing and carrying loads. Thus, in a year of rains, the cattle die by hundreds, and the survivors become inefficient workers for some time. No sufficient excess of fodder is produced in good years and owing to the bulky nature of the fodder it is impossible to import it from other countries. The actual shortage of the fodder can be easily realised when we compare the conditions of fodder supply in India with those in England, where three acres are necessary for supporting 4 heads of cattle, in U.P. not more than 2/3 of an acre of less fertile land is available for grazing of the same number of cattle. The result is the heavy cattle mortality. In the Punjab, *Chambri* grass is the principal fodder but shaftal, berseem, and lucerne can be grown as green fodder. In M. P. the fodder situation is somewhat satisfactory than the adjoining States. It is in the cotton belt that jowar is chiefly cultivated as the fodder crop, while cotton seeds also provide

1. *Second Five Year Plan*, p. 282.

a very nutritious food with the result that the cattle is strong and efficient. In the wheat-belt though grazing lands are rare but *Kans* (a grass of low nutritive value) grows over wide areas and hence no fodder crop is raised, with the result that the cattle fed on it are weak and incapable to bear the burden. In the rice-belt, as also in West Bengal, green catch crop is utterly lacking. Muddy straw is the only available fodder which offers a bare sustenance for cattle. In West Bengal the banks and slopes of the embankments of public roads are the only grazing grounds and the cattle subsist mainly on paddy straw, paddy-husks and the coarse grass which grows in tanks almost silted up. Just after the rice crop has been over they get enough to eat, but other times of the year they are half-starved. The lack of sufficient pasture, the absence of good fodder and the inability of the peasants to stall-feed their beasts have led in Bengal to a deterioration of cattle. Western Ghats, enjoying rains varying from 200 cms. to 375 cms. are quite unsuitable for the growth of good quality of grass and, hence, the cattle rearing is not largely carried on there. But in Karnataka, Nellore and Coimbatore upland areas, having a moderate rainfall and natural drainage, are conducive to the healthy growth of good grass and it is there that some of the best cattle breeds of India are found. Gujarat is also suitable for good cattle. The grass and various leguminous crops are largely produced owing to the alluvial loamy soil in area round the Rann of Kutch.

It is a striking paradox that the States which have the smallest crop areas per capita maintain the largest number of cattle, i. e., the deficiency in cattle food is greater in the thickly than in the thinly populated areas. According to Dr. Burns the smallest deficiency is in the region in which rainfall is under 75 cms. and the greater in that in which it is over 175 cms. The region with a rainfall of between 75 cms. to 175 cms. lies between these two extremes.¹

As Sir John Russel observed, the amount of food produced is insufficient for the large number of cattle. According to the Planning Commission "the quantity of fodder available is about 78 per cent of the requirements, while the available concentrates and feed would suffice only for 28 per cent of the cattle."

According to the Committee on Livestock Feeds and Fodder (1974) of the Ministry of Agriculture, the availability of concentrates, dry fodder and green fodder in 1973 was only 11.05, 309.00 and 214.5 million tonnes as against the requirements of 19.56, 347.41 and 343.57 million tonnes respectively. The estimated requirements of livestock feeds in 2000 A.D. are 82.8 m. tonnes of concentrates of plant origin, 373.0 m. tonnes of dry fodder and 594.8 m. tonnes of green fodder, while the availability is expected to be only 77.05,

1. W. Burns, *Technological Possibilities of Agricultural Development in India*.

356.8, and 575.0 m. tonnes of concentrates, dry fodder and green fodder respectively. It is, therefore, essential to find ways and means to bridge the widening gap between requirement and availability of feeding stuffs.

Investigations clearly show that the existence of goitre, osteomalacia, and other bone troubles, emaciation, birth of weak calves and pica are due to malnutrition. Animals living on imperfect diet have a greater tendency to infections of the respiratory and gastrointestinal tract, and of stone formation in the bladder. Other types of losses, such as those resulting from irregular breeding and abortion of non-infectious origin, are also due to faulty dieting. Calcium and Vitamin A deficiency in the diet of cows is also found to produce blindness among calves. Prolonged malnutrition or famine leads to the suppression of pestus. In India in draught years village cows do not bear calves or bear them only in alternative years, or even only once in three years when the body reserves for minerals and other essentials are established.

2. Want of Proper Care of Cattle. Another important cause for the deterioration of Indian cattle is the want of proper care on the part of the Indian cultivator. He does not take as good care of his cattle as his Western confrere does. This is because of their poor quality, and the deterioration in quality is due *inter alia* to lack of adequate care. In the words of the Royal Commission on Indian Agriculture. "In whatever respect Indian cattle may be lacking, they do not lack in number,"¹ The Cattle Utilisation Committee estimated that about 10 per cent of the cattle population are unserviceable or unproductive. The fact is that the productive value of the cattle is not commensurate with their number. Large numbers of diminutive cattle are a serious drain on the country's fodder supply and eat into the profits from agriculture. Weight for weight, a small animal consumes a much larger quantity of food than a bigger animal. Thus an animal weighing 155 kgs. is estimated to consume not half but about two-thirds of what an animal weighing 310 kgs would consume.

Their poor quality, as they are undersized and weak, compels the farmers in India to keep a large number of cattle to do a given amount of work. As the Royal Commission has summed it up so well. "The worse the conditions for rearing efficient cattle are, the greater the number kept tend to be. Cows become less fertile and their calves become undersized and do not satisfy cultivators, who in the attempt to secure useful bullocks, breed more and more cattle. As numbers increase the pressure on available supply of food tends to still further poverty in the cow. As cattle grow smaller in size and greater in number the rate at which conditions become worse for breeding good livestock is accelerated. As

1. *Report of the Royal Commission on Agriculture*, p. 188.

cattle become smaller the amount of food needed in proportion to their size increases. But the religious susceptibilities lie in the way of slaughter of decrepit and useless cattle and hence the cattle, however weak and poor, are allowed to live."

3. Lack of Good Breeding Stock. Another important cause for deterioration of the quality of our cattle is the lack of good breeding stock.¹ Even now there are villages where no breeding bulls are to be found and the result is that frequently the cultivators have to travel about 10 to 12 kms to take the advantages of a good stud bull or a male buffalo. The scarcity of the stud bulls and buffaloes is due to the fact that no private individual maintains stud bulls of good quality for to do so is uneconomic for him.

4. Cattle Diseases. Cattle diseases are also responsible for the decay in the quality of our cattle. In the villages, cattle suffer from a number of contagious fatal diseases like the rinderpest, foot and mouth disease, anthrax and black quarter. Animal parasites like round worms, flat worms and protozoa also cause wasting diseases. But due to lack of sufficient number of efficient and experienced veterinary doctors, cattle diseases are not properly diagnosed and treated, resulting in heavy cattle mortality. In the words of the Royal Commission, "It is indeed the fear of loss from disease that tempts many to a larger stock than is absolutely necessary and this increases the difficulty of feeding cattle properly." Epidemic diseases cause tremendous damage. A large number of cattle, attacked by disease, which escape death find their vitality sapped and health permanently injured.

At present most of the veterinary hospitals are poorly equipped, do not have modern aids for arriving at prompt and correct diagnosis of diseases, and lack facilities for undertaking surgical operations, particularly in the field of obstetrics and gynacology. Even drugs for treatment of common ailments are in short supply.

The number of veterinarians for about 26,000 cattle units in the country is inadequate to ensure cattle health. There should be at least one veterinarian for every 20,000 cattle units by 1980 ; 10,000 cattle units by 1990 and 5,000 cattle units by 2000 A.D. In areas of intensive livestock production, there should be one veterinarian for every 10,000 cattle unit from the Fifth Plan period itself. There is, thus, an urgent need to considerably improve the quality of veterinary service in the country.²

Lines of Improvement of Indian Cattle

In India, livestock has to be developed for four main purposes, viz, (i) to provide sufficient quantity of milk to the people, dairy

1. *Third Five Year Plan*, p. 347.

2. *Abridged Report of the National Commission on Agriculture*, 1976, p. 368.

industry has to be expanded at a rapid rate ; (ii) to provide needed draught power in agriculture, improvement in quality will be essential ; (iii) to provide manure for agriculture and to feed gobar gas plants for production of clean fuel ; and (iv) to produce exportable goods, like hides and skin and leather goods to earn foreign exchange.

The essentials of live-stock improvement are breeding, weeding, feeding and heeding. The efficiency of cattle depends on selective and scientific breeding. Weeding aims at getting rid of herd of uneconomic and inferior animals. For feeding, the fodder supplies need to be substantially increased and also nutritive feedstuff. Heeding implies good annual management and maintenance of proper hygienic conditions in cattle.

IMPROVEMENT IN CATTLE BREEDING

For genetic improvement three breeding methods could be adopted.¹

First, the conventional system of intensive selection of breeding animals based on individual milk production supported by a system of progeny testing. For this purpose, a selected group of cows is mated to a bull with high pedigree; and when their daughters come into milk production, the milk yield of mothers and their daughters are compared. Those bulls which have consistently increased milk production in their daughters would be retained for large-scale exploitation. Selection could bring about large improvement in characteristics which have a high heritability. But unfortunately, such heritability being quite low, it will take 15 to 16 cattle generations, even with intensive selection, i.e., almost a century. This method has its value in improving the level of milk production in some of our pure-bred milch breeds of cattle and buffalo such as Sahiwal, Tharparkar, Red Sindhi, Murrah, Surti, etc.

The *Second Method* used extensively in the case of non-descript and other low producing cattle is grading up by which the inheritance of an established good breed is introduced progressively from generation to generation by continuous top crossing. In course of about five generations of such continuous grading up, non-descript cattle could be converted to almost similar to the breeds from which bulls were used.

The *Third Method* is cross-breeding using exotic dairy breeds. Cross-breeding is the mating of animals belonging to two different breeds. Cross-breeding of well established Indian dairy breeds with exotic western breeds can, in the first generation itself, raise average production to 2500/3000 kgs. per lactation.

1. National Commission on Agriculture, *Report on Milk Production Through Small and Marginal Farmers and Agricultural Labourers*, pp. 36-38.

In India, cross breeding of Indian breeds with those of the exotic cattle of Jersey and Friesian breed (imported from Australia and U.S.A.) have been taken up with the foreign collaboration. Holstein, Brown Swiss and Red Danes have also been used for cross-breeding with Gir, Ongole and Hariana breeds.

At each unit a foundation herd of 750 indigenous breed stock is kept and frozen semen of 10 bulls of each exotic breed is used. Cross-breeding programmes have been taken up at Mandi in Himachal Pradesh (an Indo-German Project) where German Spotted Highland breed is being used ; Indo-Danish project at Bangalore in Karnatak, using Red Dane breed ; at Madupatti in Kerala, an Indo-Swiss Project, using Brown Swiss breed for crossing with Indian cattle.

Six cattle breeding farms for each separate breed have been set up with adequate facilities for shelter, essential staff, good stock of cattle, facilities for feed and fodder production and veterinary assistance and laboratory equipment for artificial insemination. The farms at :

- (1) Suratgarh, Rajasthan, for Tharparkar breed ;
- (2) Dhanrod, Gujarat for Surti buffaloes ;
- (3) Chiplima, Orissa for Red Sindhi breed ;
- (4) and (5) at Hessarghata, Karnataka ; and Koraput, Orissa, for Jersey breed ;
- (6) at Alamadhi for Murrah buffaloes.

Frozen Semen Bank has been set up near Bangalore for the production and supply of frozen semen for intensive cross breeding of cattle. With the technique of artificial insemination (A I) one bull can cover as many as a lakh cows, if the semen extracted from the exotic bull is diluted, preserved under very low temperatures. transported and used under controlled conditions.

It would be of interest to note here that the maximum lactation milk yield of cross breed, recorded at the military farms is 6,000 kgs. while the average yield is 2,600 kgs. The individual maximum daily yields recorded are upto 46 kgs.

The milk production of some important exotic breeds is :

Jersey	highest milk produce of breed (Marlu Milday), gave 11,320 kgs. of milk.
Holstein-Friesian	highest milk produce of breed (Green Meadow Lily Pabot) gave 19,262 kgs. of milk.
Swiss-Brown	highest milk produced is 14,024 kgs.
Gurnsey	highest milk produced is 12,954 kgs.
German Fleckvich	highest milk produced is 4,000 kgs.

Feed and Fodder Development

It has been estimated that the present nutrition of cattle population meets only 30.0 per cent of the needed level of concentrates and 70.0 p. c. of the roughage. Therefore, it is essential that adequate supply of quality feed, both fodder and feed concentrate, should be ensured for exploiting fully the production potential of the cross-breeds. This can be achieved in three ways :

(i) The cultivator should be taught the methods of fodder storage. The preservation of the fodder for dry seasons in the form of silage is of potential value in improving the nutrition of the cattle (particularly of growing stock and milking cows). Silage making from seasonal surplus of fodder grasses and other plant material may be adopted by large co-operatives of milk producers.

(ii) Available sources of fodder supplies will have to be supplemented. This can be done by (a) making additions to grazing areas, and (b) the cultivation of fodder and leguminous crops such as berseem, lucerne, jowar, arhar, cowpea, guar and various exotic grasses such as *Napier grass*, *Rhodes*, *Para grass*, *Sudan grass* and *Guinea grass*, etc.

(iii) On the village pasture-land rotational grazing should be compulsorily introduced everywhere. Restrictions should be placed on grazing. Pasture yields should be improved through systematic grazing and scientific management of grazing lands. Efforts should be made to rejuvenate and maintain productivity of overgrazed pastures.

(iv) Efforts should be made to decrease livestock number by using available stock more efficiently and feedstock should be increased by improvement in feed handling and feeding practices. Available feed should be used for feeding of productive animals, and the unproductive animals should be progressively eliminated.

(v) Molasses should be provided to the livestock for enriching feed and fodders with urea and for pelleting feeds. The use of sugarcane tops as feed should also be encouraged.

(v) Unconventional byproducts from slaughter houses, fallen animals, distillery wastes, canning industry, 'starch industry, forest byproducts, sea weeds and algae, etc. should be exploited for augmenting feed resources.

Without improvement in the feeding of the village cattle little progress will be made in upgrading either draft or milk producing ability.

Seven regional forage stations have been set up to demonstrate improved practices of production, conservation and utilisation of forage. These stations supply seed and planting material to livestock farms, stage agencies and other centres for further multiplication and distribution.

The National Seeds Corporation is also engaged in the production of quality seeds to ensure regular and speedy supply to farmers. Fodder Seed Production centres have also been set up by the State Governments to meet a part of their seed requirements. Due consideration is also being given to the utilization of agricultural and industrial wastes for cattle and poultry feeds.

Management Aspect

There are several aspects of management which improve the efficiency of milch cattle. By proper management practices, it is possible to reduce the dry period by at least 3 months which will improve production by a minimum of 15 per cent. This would be evidenced from the following table :

Breed	Average milk production per lactation period (kgs.)	Average milk production per lactation period when cattle are wellbred and managed properly (In kgs. in a lactation period of 300 days).
1. Sindhi	1,100	1,800 (Individual yield as much as 5,400 kgs.)
2. Sahiwal	1,350	2,700-3200 (Individual yield as much as 4,500 kgs.)
3. Deori	700	1,000
4. Gir	900	1,600
5. Murrah Cow	1,400-1,800	
6. Murrah Buffalo	200	2,500

Disease Control

The exotic and cross-breed cattle are extremely susceptible to parasitic and other diseases and requires greater protection than the local cattle. In order to protect the cattle from diseases which enter the country with foreign imported breeds, necessary quarantine and certification system need be vigorously used.

Without adequate health cover, all attempts to improve the production capacity of livestock are foredoomed to failure. Therefore a phased programme of prophylatic vaccination should be adopted. Besides, all dispensaries should have sufficient stock of medicines and facilities for routine laboratory examinations and undertaking surgical operations. A mobile veterinary clinic should be provided at every veterinary hospital. Polyclinics should be established for combating animal diseases, reproductive disorders and nutritional defects.

The Government Policy and Programmes

The Government policy regarding the development of animal husbandry envisages that in the case of well-defined milch breeds the milking capacity should be developed to the maximum by selective breeding and the male progeny should be used for the development of non-descript cattle. In the case of draught breeds the aim is to put as much milk into them as possible without materially impairing their quality for work. *The breeding policy is to evolve and develop dual purpose breeds, which will provide both good bullocks for efficient cultivation and increased quantities of milk for human consumption. Cross-breeding with exotic breeds in regions of high altitude which have heavy rainfall is also being developed.* These objectives are being achieved through Key Village Schemes, Gaushala Development and Gosadan Schemes.

Key Village Schemes. This scheme represents an effort for increasing the production capacity of the cattle. Intensive measures are being taken in selected centres called *Key Village Blocks* through controlled breeding, proper feeding and management, disease control and development of marketing arrangements. Development of pastures, better use of the existing fodder resources, popularisation of the growing of fodder and leguminous crops, construction of silo pits and feeding of balanced rations are also encouraged. The total number of Key Village blocks has come to 621 by 1973-74. Wherever possible, cross-breeding with exotic bulls have been extended to Key Village Blocks.

Goshala Development Scheme. The Goshalas are serving as cattle breeding-cum-milk production centres and are supplementing governmental efforts for supply of good breeding bulls and increasing milk production in the country. Upto the end of 1970-71, a total of 424 Gaushalas were developed under this scheme.

Gosadan Scheme. This scheme was introduced to remedy the seriousness of the problem of surplus and uneconomic cattle. It provided for the segregation of useless (old, infirm and unproductive cattle so as to avoid their further multiplication. These gosadan have been organised in the interior forests and other wastelands which are not being fully utilised at present. So far 79 gosadans, and 18 district gosadans have been established.

The main emphasis in recent years has been on the adoption of scientific breeding programmes for increasing the productivity of various species of livestock. Livestock development programmes are being organised on intensive area development basis, keeping in view the need for a remunerative market for the livestock products.

Intensive Cattle Development Projects

With the object of increasing milk production, particularly in the milk shed areas of large dairy plants, establishment of *intensive Cattle Development Projects (ICDP)* was started from 1964-65. These

are comprehensive projects in the form of a package programme and attend to all aspects of cattle development, such as, improved and controlled breeding, augmentation of feeds and fodder resources, adequate animal health cover, improved management practices, dairy extension and marketing. Each project serves a population of about 1 lakh cows and buffaloes, and is effectively linked up with a major dairy project to ensure the availability of a ready and remunerative market for milk produced by the farmers. 100 ICD projects were established upto 1977-78.

About 11 to 12 thousand Artificial Insemination (A-I) sub-centres are functioning under the ICDP programme. Besides, about 500 Regional AI centres are engaged in collection, processing and distribution of semen of superior buffalo bulls and bulls of indigenous and exotic breeds of cattle. The ICDPs and Key Village Blocks cater to the needs of nearly 15 million breedable cattle spread over 90,000 villages.

This programme will be further intensified during the Five Year Plan, 1978-1983.

The following programme of work is taken up at each ICDP centre :

(1) A village to village survey of the area selected for location of the project to ascertain the initial animal husbandry conditions.

(2) Provision of adequate breeding facilities for all the breedable cattle both by artificial insemination and natural services. Each veterinary officer looks after the breeding operations for the 25,000 breedable cows and buffaloes at each artificial insemination centre.

(3) Organisation of a mass castration campaign for complete removal of scrub bulls from the area to ensure full breeding control.

(4) Provision of veterinary equipment and medicines to each stockman for controlling contagious diseases by prophylactic vaccination.

(5) Maintenance of high yielding milch cattle by advancing loans for their purchase.

(6) Subsidized rearing of selected progeny both young bull and heifer calves on the lives of the calf subsidy.

(7) Emphasis is laid on the cultivation of quick-growing fodder crops so that supply of fodder resources is increased ; and conservation of green fodder.

(8) Holding of 400 demonstrations per year in each area, and distribution of free seeds, fertilizers and technical assistance.

(9) Provision of irrigation facilities, where they are not readily available by way of loans and subsidies for wells and pumping sets.

(10) Popularising silage making by subsidising the construction of medium-sized silopits.

(11) Organising milk producers into cooperative society and providing loans for purchase of cattle feeds and fodder and milch stock.

During the Five Year Plan (1978-83), the principal objectives of development of live-stock would be : (i) to augment considerable production of livestock products, and (ii) to promote adoption of improved methods of animal husbandry such as better feeding, breeding, proper management and animal health control for improvement in the productivity of livestock.

Poultry Development

Both eggs and poultry meat are rich in protein. Considering the high value of poultry products and the relatively small capital requirement involved, the poultry industry is recognised as an important enterprise for small farmers in rural areas. About 80% of the duck eggs and 70% of hen eggs are sold annually.

The poultry population was 73.5 million in 1951. It increased to 114 m. in 1961 and to 115 m. in 1966 ; and to 136.7 m. in 1972.

The largest number of poultry population is found in Andhra Pradesh followed by Bihar, West Bengal, Tamil Nadu, Assam, Maharashtra, Karnataka, Kerala, Orissa, M. P., U. P. and Punjab.

Domestic fowl in India is usually divided into two broad groups, the *desi* and *exotic* or improved. *Desi* breeds encompass all indigenous fowls which are not of any pure breed, such as the Punjab Brown, Naked Neck, Chagas, Brora, Karaknath, Tellichery, Kalashasti, etc. The improved breeds are those which were imported and which have now been acclaimed in India, such as White Leghorn, Rhode Island Red, Black Minorca, Plymouth Rock, New Hampshire, Little Sussex, etc.

The total number of pure breeds of improved varieties is only about 5% of the total poultry population in the country.

The average production per hen was 60 in 1956 ; and now it is about 75. The national production of eggs was 25.29 m. in 1961 ; 41.03 m. in 1966 ; 70.00 m. in 1974 and 10,000 m. in 1977. The 1977 production implied only 12 eggs per capita per year, as against the requirement of 180 eggs, on nutritional standard per annum per capita. This is in sharp contrast with per capita consumption of 295 eggs in U.S.A, 250 in W. Germany and 285 in Canada.

Causes of Low Production

Systematic rearing of birds for marketing was not common in the earlier days, and even now the poultry industry in the country is a disorganised enterprise. It suffers from various drawbacks and problems, such as :

(i) The birds are raised mostly in villages where they are maintained in small units without any care being taken about their

feeding, housing, breeding, disease, etc. (ii) Frequent outbreak of diseases causes loss to the poultry owner and this leads not only to the degeneration of stock but also slow rate of growth, and low production. (iii) Poultry keeping is largely in the hands of the poor peasants and agricultural labourers who keep small flocks of 5 to 10 birds of *desi* type but who lack scientific knowledge of poultry farming, (iv) There is insufficient attention to management and marketing of the birds. Generally, little is spent on them, the birds usually feed on kitchen waste and other stray leftover grains in the court-yard. Poultry products are sold to hawkers or local merchants at uneconomic rate. (v) A large proportion of eggs produced during summer are lost on account of lack of proper storage facilities in the villages, (vi) About 80% of the people are vegetarians and the poultry products are, therefore, not consumed on religious grounds, (vii) one important limitation to egg production is the purchasing power of the people, (viii) Another constraint is the high prices of ingredients of poultry feed like maize, rice bran and groundnut cake.

Poultry industry has a quick turn-over. Broiler chick is ready for the table in 8 to 10 weeks of its life, and an egg laying chick starts producing eggs in about 20 to 24 weeks. Recent researches have proved the rate of birds conversion of feed into meat and the rate of egg laying capacity through optimal breeding and management procedures.

To make available good quality stock needed for high production and feed conversion efficiency, the poultry breeding programme taken up at the Central and State poultry farms have been intensified through the provision of additional facilities. As a result of the breeding programme, the present average productivity of birds at some of the breeding farms is around 260 eggs per annum. To increase the capacity for multiplication of high quality stock, a project for the establishment of 5 hatcheries, each with an incubation capacity of 50,000 eggs has been taken up. Under this project 5 Regional Poultry Breeding Farms are run by the Union Government at Bangalore, Bombay, Bhopal, Delhi and Kamlah (Simla Hills), and 24 such farms run by the State Governments. In private sector large number of commercial farms with strength ranging from 5000 to 10,000 layers have been doing useful work in various parts of the country. All these farms aim at production and propagation of acclimatised birds and training of officers and farmers. Through the assistance of TBM, a wide range of equipment and consignment of 30,000 chicks of White Leghorn and Rhode Island Red breeds were imported to provide necessary encouragement to the projects. Besides 300 Poultry Extension-cum-Demonstration Centres were established to introduce modern poultry farming in rural areas.

During the *Third Plan*, 77 Intensive Projects closely linked with hatcheries, food mixing units, marketing centres and extension organisations were established and the required inputs and service, for setting up the commercial poultry farms around the cities and

industrial townships, were provided. 2 processing units, 68 feed mills and 18 marketing centres were also set up.

During the *Fourth Plan*, emphasis was laid on the production of better breeding stock, dissemination of scientific farming practices and strengthening of the existing marketing structure. An In-service Training Institute in poultry was set up in Bangalore for providing training in breeding, nutrition, management and training. Facilities for broiler production were expanded. Two poultry dressing plants were started at Poona and Chandigarh, with a daily capacity of 800 and 400 birds respectively. A large number of small-sized processing plants are working in the states. Egg collection and marketing centres have been set up at Calcutta, Delhi, Bombay and Madras in the Cooperative sector with facilities for cold storage as also on egg powder plant at Bombay.

The *Fifth Plan* visualises a growth rate of about 10 per cent per annum to achieve the target of 17 million eggs in 1979, from 7,700 m. in 1974. For this, the population of improved hens will increase to 60 m. with 30 m. growing stock by 1979. Poultry producers' Cooperative societies will be established to provide marketing facilities for eggs.

Future Prospects

Poultry production offers great scope and has a large potentiality for quickly increasing the supply of protein in the dietary of the people. Therefore, a suitable programme of improved poultry production in rural areas would not only improve the economic conditions of small and marginal farmers and agricultural labourers, but also augment the production of eggs and poultry meat which is in large demand in urban areas. Poultry farming has certain special features which favour its large scale adoption by small and marginal farmers and agricultural labourers. "Land required for poultry farming is very little ; the capital investment is not very large and poultry farming can be started on a small scale and expanded gradually.....it can be raised under all agro-climatic conditions in the country.....It has a greater flexibility and can be adjusted as per market situation.....Brooding equipments are also easily available within the country.....With rapid improvements made in private and government farms, quality stock of different ages (such as day-old chicks, grower-pullets and ready to lay birds) are easily available in large numbers...Poultry can make use of coarse grains and agricultural by-products (such as rice polish, bran) as feed. Capital invested starts paying back within a short interval. The enterprise ensures a steady income throughout the year. Deep litter system of poultry raising would make available valuable manure...When the production of coarse food grains is increased, as a result of intensive agricultural practices, poultry farming offers an outlet for their profitable utilisation.¹

1. National Commission on Labour's *Interim Report on Poultry, Sheep and Pig Production*, etc., 1973, pp. 18-19.

The steps to encourage expansion of poultry farming may be towards the exploitation of rural potentialities, as a backyard project for urban areas and as a commercial business.

Once poultry industry develops, increasing attention will have to be given to (a) disease control measures ; (b) poultry marketing, (c) larger hatching capacity ; (d) educational programmes to encourage poultryman to purchase day-old chicks ; (e) confinement rearing and feeding of balanced rations ; (f) research for nutrition and other poultry problems ; and (g) development of a poultry feed manufacturing industry.

Piggery Development

Pigs are an important source of the supply of protein rich meat—pork. They are prolific breeders and are good converters of farm by-products and kitchen waste and with some supplemental feeding with coarse grain they are capable of producing quality pork. Improved pig rearing could be made into a profitable subsidiary occupation for improving the economic lot of a number of backward communities such as Harijans, Balmikis, Sweepers, Dhammans, Voddars and Tribals.

There were 4.93 million pigs in 1956, 4.98 million in 1966 and 6.4 million in 1972. They form less than 1 per cent of the world's pig population, producing about 50,000 tonnes of pork. Pig as a source of meat has not been properly exploited, for pigs are considered fit only to be reared on garbage and are allowed to remain as scavenging animals in villages and towns for their rearing has not been considered as a respectable farming occupation. Hence, pig rearing has been relegated to the hands of socially backward and economically weaker sections of the people. Further, indigenous pigs are uneconomical for commercial exploitation because of their low growth rate, poor body weight, small litter size and late maturity.

Pig rearing can be developed as a subsidiary occupation by ensuring supply of good quality stock well-adapted to village conditions, breeding facilities, health cover, supply of supplemental feeds, improved management practices, training and extension, link up with marketing centres such as pork processing plants or urban slaughter house organising of pig breeders' cooperatives.

If pig rearing has to be profitable, replacement of indigenous types of pigs by cross-breeds or pure breed exotic animals like Middle White Yorkshire, Large White Yorkshire, Landrace is necessary. However, such cross-breeding would need an efficient system of feeding (such as cakes, chunis, bran, broken grains and by products from slaughter houses and other balanced feeds) and management regimes such as early breeding, large litter size, mothering ability, rain or gain, feed conversion efficiency etc.

Under the piggery development programme, 8 modern large regional pig breeding farms cum-bacon factories and pork processing

plants have been set up at Harringhatta (W. Bengal), Koothatukulam (Kerala), Borivilli (Maharashtra), Gannavaram (A. P.), Alwar, (Rajasthan), Aligarh and Ranchi. Around these bacon factories, piggery development has been stepped up through the supply of quality breeding stock and health support and training of farmers in modern pig raising. In 1977-78, about 2,000 tonnes of pork and pork products were produced in these factories.

So far, 52 pig farms and 174 piggery development blocks have been established. The regional breeding stations produce selected breeds of pigs for multiplication and distribution in piggery development blocks.

In the *Fifth Plan*, it is proposed to establish intensive piggery development projects around bacon factories and pork plants. 23 pig breeding farms would be set up. A new pig breeding station will also be set up for maintaining a genetic pool of high quality, imported stock.

Sheep Development Programmes

India stands sixth among the countries of the world in sheep population. There were 39.24 m. sheep in 1956 and 42.01 m. in 1966. In 1972, the number declined to 40.39 million. Sheep provide not only wool but also mutton, sheep skins and manure. The largest number of sheep is found in Andhra Pradesh followed by Rajasthan, Tamil Nadu, Karnataka, U. P., Maharashtra, Gujarat and Jammu and Kashmir.

There is a wide variation in the types of sheep found in different parts of the country. In the temperate Himalayan sheep region and dry western region, sheep are of woolly type. The main breeds being Gurej, Karnat, Bhakarwal. Gaddi and Rampur Bushan in the former region and Lohi, Bikaneri, Marwasi, Kutchi and Kathiawari in the latter region. In the southern and eastern regions, sheep are mainly of the hairy type and are bred for mutton production, the main breeds being Deccani, Nellore. Bellari Mandya and Bandur.

The average wool and mutton production of Indian sheep is low. For instance, Rajasthani sheep give on an average about 1.4 Kg. of wool a year, while in countries like U.K., Australia and New Zealand, the fine breeds produce annually 5 to 6 Kg wool. The quality of wool compared to Indian wool is also inferior. The Indian sheep are inferior in size to many exotic breeds. The rams and ewes of Indian breeds of sheep weigh between 27 and 36 kgs. and between 18 and 27 kg. respectively, whereas pure bred rams of many exotic breeds weigh between 60 and 113 kg. and ewes between 54 and 74 kg respectively. Therefore, the yield of mutton from Indian sheep is low in comparison with that of the exotic sheep.¹

1. *National Commission on Agriculture Ibid*, p. 41.

Therefore, there is good scope for effecting genetic improvement for increased production of wool and mutton. Such improvement can be brought about through adoption of a sound selective breeding programme. Several breeding programmes so far undertaken in the country adopting selection and/or cross-breeding have shown that under proper care and management conditions, the Indian sheep has potentiality for improvement.

The sheep development programme for the small and marginal farmers and agricultural labourers should aim at improving the production capacity of the flocks already owned by them and/or introduction of good quality sheep with the farmers as a mixed farming system. It is estimated that we have about 24 breeds of sheep of which only 5 are considered as medium or fine wool breeds, 14 as coarse carpet quality wool breeds and the rest as mutton breeds. Increasing the productivity of sheep could be attempted in three ways, viz, (i) improving the yield and uniformity of carpet wool; (ii) improving the yield of mutton and meat type indigenous breeds particularly in the south; and (iii) developing new fine wool and mutton breeds adapted to the different agro-climatic regions in the country through cross-breeding of indigenous sheep with exotic breeds.

Some trials have been made to study the result of cross-breeding indigenous breeds with exotic fine wool breeds for improving wool production. Breeds such as Australian Merinos, Russian Merinos, Spanish Merinos, Rambouillet, Polworth, etc, have been used for cross breeding. Some fine wool breeds have been evolved from such crosses; as *Hissardale* (produced by inter-breeding 7/8th Australian Merino and 1/8th *Bikaneri* sheep); *Kashmir Merino* (through inter-breeding Merino with Deccani crossbreeds) and *Nilgris* (through inter-breeding crosses of Cape Merino, South Down and Cheriots rams with Coimbatore).¹

So far as cross-breeding of sheep for mutton production is concerned, research programmes should be initiated in different regions of India to study the suitability of a number of exotic breeds of sheep for cross-breeding with local types. Experimental studies may also be taken up in a number of large sheep breeding farms of the Animal Husbandry Departments.

The programme for developing sheep should be taken up through small and marginal farmers and agricultural labourers in such SFDA/MFAL districts located in sheep breeding tracts or in those districts which can be easily linked up with Wool Grading and Disposal Centres and/or large mutton consuming markets in cities and large towns. In the northern temperate regions, where sheep are reared mainly for wool production, progressive cross-breeding

1. Acharya, R. M., and Arora, C. L. "Progress in Sheep Genetic and Breeding Research", *Indian Farming*, Vol. XXII. No. 4, 1972, p. 123.

with fine wool exotic breeds should be popularised, as with Rambouillet, Merinos and Corriedale ; while in the northern plains and western arid zones, cross breeding with breeds like Rambouillet and Merinos for production of quality wool should be adopted particularly in Rajasthan, Gujarat and Haryana, where Chokla/Nali or Patanwadi breeds are reared. In areas where cultivation of crop is more intensive and where irrigation facilities are comparatively better (as in south eastern Rajasthan where Sonadi and Malpura sheep predominate) cross breeding with Corriedale breed could be adopted to produce dual purpose sheep with improved wool, higher growth rate and better body weight. In good quality wool producing areas, the policy should be to encourage selective breeding for improvement in body weight and wool yield of uniform quality. In the southern regions, breeds like Deccani, Bellary and Coimbatore could be crossbred with Corriedale breed for improving both wool and mutton. In other areas, selective breeding or grading up local sheep with breeds like Mandya, Nellore, Madras Red should be carried on.

Other Measures for Sheep Development

Special attention should be given to improve quality of grass lands used for grazing sheep. For this the village Panchayats should be given adequate financing assistance and technical guidance by the State Governments for developing grasslands through fencing, reseedling and application of fertilizers.

Further, timely detection and control of sheep diseases must also be given due attention by the extension veterinarians. The farmers should be given training not only in breeding and management practices but also in improved methods of shearing, classification and grading of wool for the market. Equipments, machinery and development of intermediate technology for utilization of improved wool should be arranged by the State departments. Sheep Breeding-cum-Wool Marketing Cooperative Societies should be organised at the primary level to cover every phase of activity of sheep production and marketing of wool and mutton.

Government Action

A large sheep breeding farm has been set up at Hissar, for this assistance in the form of breeding stock, equipment and experts have been provided by Australia. Three large sheep breeding farms have also been set up in Andhra Pradesh, Jammu and Kashmir and Karnataka. In 1960-61, there were 14 sheep breeding farms in the country. The number increased to 24 in 1965-66 and to 32 in 1968-69. At the end of 1973-74, it was expected to reach 45. During this period, the sheep and wool extension centres increased from 305 to 461 and 503 and by 1973-74 it may reach 553. The production of wool during Fifth Plan will be about 31.0 m. kg. The programme of sheep shearing wool grading and marketing was initiated with the assistance of UN DP in Rajasthan. It is now working in 8 centres.

Production of mutton during the Fifth Plan would be 258.4 m. kg. by 1978-1979 as against 114.84 m. kg. in 1973-74.

DAIRY INDUSTRY

In India, a large proportion of population is vegetarian, in whose diet milk and milk products assume a great importance, as they are the only source of animal protein in their diet. Here both cows and buffaloes are important animals for producing milk. The milk of goat, sheep and to a lesser extent that of camel and ass is also used. Goat milk is used in most parts of the country, constituting about 4 percent of the country's total production, as against about 53 percent provided by the buffalo and 33 percent by the cow. No estimates are available of the quantities of milk supplied by the sheep, camel and ass used as human food. The use of milk from camel is known to be confined particularly to parts of Rajasthan and Gujarat, while that from ass is reported to be used to some extent in parts of Gujarat. Sheep milk is used more widely than that of the camel or ass and is largely confined to hills and grazing areas where large flocks of sheep are to be found.¹

The bulk of the milk supply of the country is produced in rural areas. It has been estimated that only 4 percent of milch cows and less than 61 percent of milch buffaloes are kept in towns and cities.²

U. P. is the largest producers of milk followed by the States of Punjab, Bihar, Andhra Pradesh and Rajasthan. M. P. and Orissa account for very low production.

The percentage distribution of monthly production of milk and milk products in different states is as below.³

% Distribution of Monthly Production of Milk and Milk Products

State	Cows' milk	Buffaloes' milk	Cows' ghee	Buffaloes' ghee
1. U. P., Bihar, Orissa	19.56	42.08	11.16	39.26
2. W. Bengal, Assam	30.16	6.00	6.02	3.00
3. Karnataka, Tamil Nadu, Kerala	11.10	7.77	10.04	7.90
4. Maharashtra and Gujarat	11.00	15.55	11.26	12.49
5. M. P., Andhra	11.18	6.37	8.57	9.97
6. Rajasthan, Punjab, Haryana, hill districts of Himalaya	18.00	22.19	52.95	27.38

1. *Agricultural Situation in India*, March 1959, pp. 149-150.

2. *Report on the Marketing of Milk in India*, 1941, p. 4.

3. *National Sample Survey Report*, No. 35,

Production of Milk in India¹

Year	Cow milk (In thousand tonnes)	Buffalo milk	Goat milk	Total 000 Tonnes
1940	7,517	9,090	502	17,109
1945	7,698	9,778	498	17,974
1951	7,743	9,184	479	17,406
1956	8,180	10,976	561	19,717
1961	8,753	11,087	535	20,375
1966	6,918	11,879	571	19,368
1968-69	8,904	11,660	636	21,200
1969-70		Not Available		21,210
1970-71	9,450	12,375	675	22,500
1971-72				
1972-73		Not Available		
1973-74	9,744	12,760	696	23,200
1977-78	—	—	—	27,500
(anticipated)				
Five Year Plan	—	—	—	35,000
(1979-83—anticipated)				

Dairy farming in India is still not so well-developed as it is in countries like Denmark, Sweden, Canada, Australia, New Zealand or U.S.A. In India it was begun in 1881 when cream separators were first introduced. The first large scale dairy farm was started by the military in 1891 at Allahabad and the development of more dairy farms led to the creation of the post of Indian Dairy expert in 1920.

Since Independence, there have been developed 186 dairy plants, comprising 92 liquid milk plants, 68 pilot milk schemes/rural dairy centres, 26 milk products factories besides 3 creameries. In addition, 51 dairy projects are under different stages of implementation. The average dairy through-put of milk was of 16 lakh litres in 1967-68 ; 20 lakh litres in 1969-70, 22.50 lakh litres in 1970-71, 24.00 lakh litres in 1971-72, 29 lakh litres in 1972-73. and 28.82 lakh litres in 1973-74 ; and 55.28 lakh litres in 1977-78.

1. *Indian Agriculture in Brief*, 1976, p. 121; *Draft Fifth Five Year Plan* Vol. II, p. 30, *Draft Five Year Plan*, 1978-83, p. 145.

The important dairy centres in the country are :¹

State	Centres of Dairy Industry
Assam	Gauhati, Shilong.
Punjab	Amritsar, Jind, Hissar, Dasuya, Gohna, Ludhiana,
Chandigarh	Chandigarh.
U. P.	Agra, Aligarh, Allahabad, Almora, Haldwani, Kanpur, Mathura, Varanasi, Lucknow, Bareilly, Dehra Dun, Moradabad, Gorakhpur.
Tamilnadu	Ootacamund, Kanyakumari, Coimbatore, Kodai-kanal, Tiruchirapalli, Thanjavur, Madurai, Erode, Madras, Chidambaram.
Gujarat	Baroda, Mehsana, Anandi (Amul), Rajkot, Ahmedabad, Bhavnagar, Jamnagar, Junagarh, Surendranagar, Surat.
Andhra Pradesh	Vijaiwada, Hyderabad, Vishakhapatnam, Warangal, Rajmahmundry, Guntur, Kurnool, Nellore, Chittoor.
Kerala	Trivandrum, Calicut, Kottayam, Cannanore, Alleppey, Ernakulam, Palghat.
Delhi	Delhi.
M. P.	Khandwa, Kanti, Raipur, Ratlam, Sagar, Chindwara, Guna, Rewa, Ujjain, Bilaspur, Bhopal, Gwalior, Indore, Jabalpur.
Orissa	Cuttack.
W. Bengal	Hooghly, Haringhata.
Rajasthan	Jaipur, Udaipur, Bikaner, Jodhpur, Alwar, Bharatpur.
Maharashtra	Bombay (Arey), Dharwar, Aurangabad, Nagpur, Akola, Amraoti, Dhulia, Kolhapur, Nasik, Pune, Udgir. Miraj, Sholapur, Ahmednagar, Kudigee.
Karnataka	Bangalore, Belgaum, Gulberga, Hubli-Dharwar, Mysore, Mangalore, Devangere, Bhadravati.
Bihar	Bhagalpur, Gaya, Patna, Darbhanga, Dhanbad, Ranchi, Barauni.
Haryana	Jind, Bhiwani, Ambala.

The milk product plants are working at Ahmedabad, Aligarh, Baroda, Bangalore, Coimbatore, Chandigarh, Anand, Mehsana, Amritsar, Jind, Moradabad, Kolhapur, Hubli-Dharwar, Pondicherry, Hyderabad, Trivandrum, Kanyakumari, Rajkot and Vijaiwada.

1. C. B. Mamoria, *Geography of India*, Vol. 1, 1975,

These produced 40 tonnes of milk powder per day in 1969-70 : 45 tonnes per day in 1970-71, 50 tonnes per day in 1971-72 and 50 tonnes in 1972-73. Of the milk products, the quantity of table butter and ghee manufactured was around 30 tonnes in 1969-70 ; 35 tonnes in 1970-71, 40 tonnes in 1971-72 and 41 tonnes in 1972-73. Two composite milk plants are working at Barouni and Bhiwani.

Yields of milch Animals

Although in the matter of total milk production in the world, India ranks only next to U. S. S. R., the quantity produced is far from adequate. The total production of milk in India was about 17 m. tonnes in 1951 ; 12 million tonnes in 1956 ; 20 million tonnes in 1966 ; 22m tonnes in 1971 and 23 m. tonnes in 1973-74. India roughly produces 7% of the world's production. The average annual milk yield is estimated at 187 kgs. per cow ; 504 kgs. per buffalo and 55 kgs. per goat. Against this, the average milk yield per cow in Netherlands is 4,220 kgs ; USA 4,154 kgs. ; Denmark 3,902 kgs. ; Switzerland 3,950 kgs. and U. K., 3,950 kgs. and 2,974 kg. in New Zealand.

It has been estimated that of the total number of cows in India, about 55 per cent do not yield milk at all. Further, 94.3% of the cows yield less than one kg. and only 0.4 % yield over 2 kgs. daily. In case of buffaloes, 19.2% yield less than 1 kg. and 80.8% yield over 2 kgs. daily.

The highest average daily milk production per animal in milk both for cows and buffaloes is in Punjab, which is only 2.28 kg. and 3.99 kg per day respectively. This shows that considerable efforts have to be made on planned and scientific basis, for ensuring economic milk production in India.

Another noteworthy feature is that the present availability of milk is estimated only around 108 gm per head per day. The Nutrition Expert Group of the ICMR has recommended 300 gm. of milk for pre-school children, 250 gm. for school children in the age-group of 7-12 years and for boys and girls from 13-18 years of age, and 200 gms. for adult man and woman and an additional 150 for expectant mothers. These are for vegetarian diets. For non vegetarian people the recommended requirements range from 200 gm. for children to 100 gms, for adults. This shows a wide gap between the actual per capita availability and recommended requirements.¹

According to one estimate, milk production may reach a level of 31 m. tonnes by 1981, thus implying a per capita consumption of only 120 gm.² The minimum nutritional target per head per day

1. Quoted by National Commission on Labour in its *Interim Report on Milk Production through Small and Marginal Farmers and Agricultural Labours*, 1971, p. 10.

2. *Ibid.*, p. 10.

recommended by Dr. Sukhatme comes to about 201 gm. On the basis of 201 gm. of milk per head the requirements in 1981 would be of the order of 51.26 m. tonnes.¹ Curiously enough, the target set by the Fifth Five Year Plan for milk production is 28.60 m. tonnes by 1978-79, with the base level production of 23.20 m. tonnes in 1973-74.²

Of the total milk production of about 23 m. litres, it has been estimated that about 39.8 per cent is used as fluid milk, while 38.7 per cent is converted into ghee. Of the remaining 21.5 per cent is utilised as *dahi*. 6.1 per cent as butter, 4.8 per cent as *khoa*, 0.5 per cent as ice cream, 0.7 per cent as cream and 0.5 per cent as other products like *malai*, *channa* etc.

Due to hot climatic conditions and lack of proper means of communications over long distances, ghee is probably the only stable form in which milk is sold. With the recent development of dairy industry and rapid means of transport, through motor-vans, large supplies of milk are now being brought, as fluid milk, to the urban areas.

Problems of Dairy Industry

The dairy industry in India is faced with several problems such as :

(i) The small scale holdings and scattered milk production in the villages. The collection of small quantities of milk produced in such areas and its transportation in good condition to urban markets present many difficulties. Most of the villages are not connected by all-weather roads and are inaccessible during certain parts of the year. Consequently the milk produced cannot be fully utilized.

(ii) There do not exist adequate facilities for cooling and refrigeration and rapidly moving railway vans so that it is difficult to keep milk in good condition during its haulage and transport. Owing to unhygienic conditions of production and handling of milk and high temperatures, the quality of milk supplies available for distribution is generally not satisfactory.

(iii) The demand for milk and milk products is uniform throughout the year but the production is not only localised in certain areas but is also distinctly seasonal. Milk yield is very high during the period between October and March but low between May and September. In the hill districts of the Himalayan region and Rajasthan, milk production is rather constant throughout the year between 20 and 22 per cent, while in South India, the percentage of milk production is very poor, 8.53 per cent in summer and 10.37 per cent in the rainy season. Therefore, efficient dairying requires diversification for production of milk powder, condensed milk, pro

1. Quoted by National Commission on Labour in its *Interim Report on Milk Production through Small and Marginal Farmers and Agricultural Labourers*, 1971, p. 10.

2. *Draft Fifth Five Year Plan*, Vol. II, p. 30.

cessed cheese, instant milk food, etc. which can be preserved and sold throughout the year. In the lean season, milk powder may be used to add to the supply of fresh milk to consumers.

(iv) The methods of production followed by the producers are crude, primitive and extremely wasteful of labour. Hand milking is universal and udders are rarely washed. Milk is transported in vessels which generally affect its hygienic and its keeping qualities, chances of contamination are many and the risk of spoilage serious. Gowalas and cultivators do not adopt clean methods and the general poverty of the producers and lack of equipment make the adoption of progressive methods difficult.

(v) Cattle rearing in India is carried out under a variety of adverse climatic and environmental conditions. Cattle husbandry centres round the small cultivator, to the large majority of whom livestock raising is subsidiary to crop production. Being resourceless, he cannot give proper attention to his cattle. This neglect reduces milk yields of cows and the quality of the breed. The situation is further aggravated by lack of feeding stuff and fodder, and the availability of permanent meadows and grasslands. Unfortunately, in India the permanent pastures and meadows per livestock unit is only 0.06 hectares, whereas in Australia it is as high as 14.59 hectares, in USSR 3.80 hectares, in USA 2.64 hectares and in UK 0.90 hectares.

Grazing facilities, followed by increased use of concentrates and fodder be encouraged.

(vi) Due to the existence of a multiplicity of agencies and persons handling milk and milk products it is difficult to exercise an effective control over the supply of milk and milk products brought to the market. Therefore, elaborate codes of practices, sanitation standards and quality standards have to be more vigorously enforced.

(vii) The milking capacity of Indian cattle is very small and hence a large number of cattle are to be maintained for getting required quantity of milk. This number is a great drain on the scarce fodder resources. Cross-breeding, therefore, can bring about the desired reduction in number of unwanted animals. Introduction of such practices can definitely increase capacity of the milch cattle.

(viii) Milk production needs considerable investment and risk-taking. Unless the producers are guaranteed a reasonable price on a long term basis their economy is affected adversely. The price of milk is determined by several milk schemes on the basis of the price in the open market, which in turn is determined by the price of milk products like *ghee* and *khoa*. Therefore, a guaranteed and stable price covering costs and bringing about a reasonable profit, consistent with the quality of milk, should be assured to the producers.

Attempts have recently been made to improve milk supply to cities and towns through :

(i) Organisation of cooperative milk producers' societies and milk supply union, pilot milk schemes for collecting milk from villages, lying at a distance ranging from 50 to 150 kms.

(ii) Colonization of city milch cattle in outlying rural areas from where milk could be collected and distributed through coupons.

(iii) Organisation of milk supply projects near urban centres for collection, processing and distribution of milk, through milk vans, to urban population.

(iv) Establishment of creameries and dairy factories for the utilization of surplus milk in areas producing large quantities of milk.

During the Fifth Plan, the annual milk production is sought to be stepped up from 23.2 tonnes to 27.5 m. tonnes, through a massive programme of cross-breeding and other genetic improvements and development measures on feed, animal health, and management fronts. This will be integrally linked with markets. The dairy programme will be extended by taking up some more integrated cattle-cum-dairy development projects to serve the major cities with a population of 5 lakhs or more and their milk-shed areas-like Lucknow, Kanpur, Jaipur, Ajmer, Bhopal, Indore, Hyderabad, Secunderabad, Bangalore and Mysore. Milk supply schemes will also be taken up for towns with a population of 50,000 and more. For smaller towns of isolated milk pockets 80 rural dairy centres will be added.

Operation Food Project.

With the help of the World Food Programme (W.F.P.) the department of agriculture of the Government of India, formulated a project for stimulating milk marketing and dairy development in India. Under this project, the WFP agreed to supply free of cost, during the 5-year period (from 1970-71 to 1974-75) 126 thousand tonnes of skimmed milk powder and 42 thousand tonnes of butter oil, worth Rs. 41.90 crores at international price. After recombination of the skimmed milk powder and butter oil into liquid milk at the public sector dairies at Bombay, Calcutta, Delhi and Madras, the milk will be sold and the sale proceeds from the quantity estimated at Rs. 95.20 crores will be used for increasing milk processing facilities of the public sector dairies from 1.00 million litres at present to 2.75 million litres per day at the end of the five year project period. The generated funds will also be used for increasing milk production and procurement in the ten States.¹

This will be achieved by the provision of technical inputs which will include production of ready mixed concentrates and green

1. Andhra Pradesh, Bihar, Gujarat, Haryana, Maharashtra, Punjab, Rajasthan, Tamil Nadu, U. P. W. Bengal and Delhi.

fodder, artificial insemination, veterinary services and medicines, calf rearing assistance, development of improved milch animals and organisation of rural procurement of milk. The project will also provide for the resettlement of the city kept cattle and buffaloes in the adjacent rural areas.

This project is considered as the world's biggest milk drive. It involves the following actions.

- (a) Major increases in the capacity and output of dairy processing facilities from about 1 million to 2.75 m. litres per day ;
- (b) Competitive transfer of the bulk of the urban markets for traditional supplies of raw milk to the modern dairies ;
- (c) Resettlement in rural areas of cattle in the cities, which at present serve a large part of these city markets ;
- (d) Development of the basic transportation and storage facilities to facilitate regional and seasonal balancing of milk supply and demand.
- (e) Development of milk procurement systems in appropriate rural areas in order to provide for raw milk in a channel which is more remunerative than the traditional channel ;
- (f) Improvement in standards of dairy farming by programmes of animal breeding, veterinary services, feed stuff supplies and management, thereby increasing milk yields per animal.

The project would be assisting in all 10.88 lakhs of small and marginal farmers and agricultural labourers in 57 districts. Besides about 10 million persons will have an additional milk supply so that the per capita availability is increased from 108 gm. to 280 gm.

The project involves rearing of high yielding cattle by developing facilities for production and supply of about 3,575 tonnes of concentrate feed mixtures per day and production of green forages from 7.66 lakh acres. Intensive cross-breeding of cows with exotic dairy breeds would supplant the population of 14 lakhs of indigenous cows by cross-bred progeny. Simultaneously, increases in production performance of buffaloes would also be brought about by selection, cutting of low producers and by breeding with superior sires through artificial insemination. About 18.75 m. milch cattle were expected to be involved in the project.

Under this project, a milk plant is to be set up in every district in Punjab within next ten years, when the output of milk is expected to be doubled. Dairy complex is being developed at Ludhiana, Bhatinda, and Amritsar ; while composite milk plants are being set up at Jullundur, Gurdaspur and Patiala.

In Haryana, a chain of milk plants are being put up, at Bhawalpur, Jind and Ambalaya.

In Rajasthan, an ambitious dairy plan has been prepared for setting up milk banks at Jodhpur and Bikaner, each handling 100,000 litres of milk every day, at Bharatpur and Alwar, with handling capacity of 60,000 litres each per day. Milk from these centres is now being supplied to Delhi.

To implement the project, "Operation Flood", Indian Dairy Corporation was set up at Baroda, which along with the National Dairy Development and ICAR is responsible for financing, promoting and providing technical services, training and material inputs, including manufacture of immunological and biological veterinary products as well as dairy equipments. Up to the end of March 1972, the W.F.P. had supplied 16,500 tonnes of skimmed milk powder and 3,700 tonnes of butter milk. The funds generated amounted to Rs. 8.58 crores. They were likely to reach Rs. 36 crores by March 1974. The project is operating in about 50 districts, which constitute the milk shed areas of the four metropolitan city dairies.

During the Fifth Plan, Corporations will be organised for undertaking a massive cross-breeding programme with semen from exotic proven stock.

Being encouraged with the spectacular development of the Anand Milk Corporation Society, which started with a handful of members in June 1948 in two villages producing just 250 litres of milk a day the society had 706 societies and 180,000 former members having a breedable buffalo population of 2.25 lakhs in 1970-71, and the quantity of milk was over 124,000 litres, the National Commission on Labour has recommended that "Amul Pattern" should be spread in 107 districts, in the country to help small and marginal farmers. The areas recommended for initial start of this programme are :

1. Assam — Gauhati dairy covering Naugong, Goalpara and Kamrup Districts.
2. Himachal Pradesh — Mandi dairy to cover Simla district.
3. J & K — Srinagar dairy to cover Anantnag and Baramulla Districts.
4. Kerala — Ernakulam-Cochin dairy to cover new milk-shed areas to be developed in the hills and Quilon and Cannanore districts.
5. M. P. — Bhilai, Rajpur dairies to cover Durg and Bilaspur districts.
6. Karnataka — Hubli-Dharwar dairy and the new dairy to be located to cover Dharwar and North Karnara districts.
7. Orissa — Cuttack dairy to cover Cuttack, Keonjhar and Dhenkanal districts.

CATTLE INSURANCE

The need

Cattle population forms a substantial share in the world's total but unfortunately not only cattle here are famished, undersized and subject to a large number of contagious diseases of the foot and mouth, but are also widely dispersed. Besides, there are about 72,43,000 stray cattle in the country. Veterinary services are yet not fully developed. As a result of all these cattle succumb easily to the attack of ghastly diseases and pests leading to heavy cattle mortality. To replace them needs large capital, which leads the farmers to borrow from the money lenders and thus is involved in serious indebtedness. All this points to the need of implementation of cattle Insurance Schemes in selected pilot areas in the country.

In Foreign Countries

It would be of interest to know that cattle insurance schemes are in vogue in many Western European countries, particularly Denmark, Sweden, West Germany, France, Italy etc. The reasons favouring the scheme have been : (a) preponderance of small farmers owning a few cattle, with increasing need for their protection against accidental losses ; (b) live-stock based farming, which need proper care and protection of cattle against diseases and pests ; (c) the Government initiative of helping the farmers by payment of subsidy, provision of re-insurance, and other liberal facilities ; and (d) the development of cooperative and mutual insurance societies, which charge low premiums.

Priolkar's Scheme for Cattle Insurance

In India, Mr. Priolkar was appointed in 1948 to study the problem of cattle insurance. He submitted his report in 1948, with these recommendations :

(i) Cattle insurance should provide protection against losses due to contagious diseases, the incidence of which differs considerably between different classes of animals and between different areas. Areas having comparatively lighter incidence should be selected for the operation of the pilot schemes.

(ii) Provision should be made for regular and compulsory protection of insured animals against *rinderpest* by the 'Serum Simultaneous' method in all cases, and against *anthrax*, *haemorrhagic*, *septicaemia* and *black quarter* at least in those tracts where these diseases are of most common occurrence.

(iii) The existing field agencies of the State Veterinary departments are inadequate for providing veterinary services in connection with cattle insurance schemes. Therefore, additional facilities must be provided in the areas of operation of the scheme.

(iv) Insurance may be offered in two types of centres. In rural centres insurance may be confined to working bullocks between specified age-limits : while in urban centres, it may be extended to milch animals.

(v) Six rural and six urban centres were suggested for the operation of the pilot scheme, wherein 1000 to 2000 cattle be insured at each centre. A rural centre may comprise an area of approximately 300 sq. miles, while an urban area may include the city and area within a distance of 5 miles around it.

(vi) A Pilot Scheme should be operated through the Cooperative cattle insurance societies with state aid in various forms or as a purely state-managed scheme.

(vii) The Government should provide help to these societies, during the pilot scheme stage, by giving establishment grant, contributing to share capital, free veterinary help, annual grants for secretarial expenses, guaranteeing interest-free loans to societies when they find it difficult to pay the claims.

But on these recommendations, no action was taken. However, a beginning was made by the Cooperative Mutual Insurance Company, Bombay, to insure milch cattle and draught animals in Maharashtra and Gujarat. Schemes to explore the possibilities of cattle insurance has been proposed by Andhra Pradesh, U. P., Maharashtra, Rajasthan, Karnataka, Tamil Nadu and Punjab.

While starting the Pilot Schemes, following precautions should be taken :

(a) About two-thirds of the value of cattle be considered for insurance purpose, so that the owner could get this much value in case of death of the animal.

(b) Losses due to wilful negligence of the members, such as under feeding or improper care of the cattle, be reduced by providing constant supervision and timely medical help to the diseased animal.

(c) The scheme should be made applicable to healthy and good quality animals only, and that too between the age of 3 to 10 years.

FISHERIES

Fishery Areas

India has a coastline of 5700 kms. long and a continental shelf of 259,000 sq. kms. or more in area in which several hundred rivers discharge rich silt laden waters. The inland water spread covers about 800,000 hectares. There are about 40,000 tanks ; 112,000 km length of rivers and 13,500,000 open wells in India offering considerable scope for the development of fisheries.

The Bay of Bengal and the Arabian Sea abound in fishing grounds. Gulfs and bays all along the coast and a number of is-

lands with their mangrove swamps and coral reefs are rich source of marine fish. Tidal estuarine waters in the mouth of large and perennial rivers, large brackish water lakes, back waters, lagoons, and swamps scattered along the entire coast line, afford lucrative estuarine fisheries. Vast stretches of fresh water consisting of rivers, streams, lakes, reservoirs, tanks, ponds, and paddy fields offer scope for inland fisheries. The principal rivers of India, including their main tributaries, have a total length of 27,360 kms. and the length of canals and irrigation channels is 1,12,650 kms.

According to the survey undertaken by the Central Marine Fisheries Research Institute (in 1961-62) in the eight states of Andhra Pradesh, West Bengal, Orissa, Tamil Nadu, Kerala, Karnataka, Maharashtra and Gujarat. The total number of fishing villages is estimated to be 1797; the marine fishermen population of 958,937 and the number of fishing craft, one lakh non-mechanised boats, 14,400 mechanised craft and 86 trawlers. Tamil Nadu has the highest number of fishing villages followed closely by Andhra Pradesh, Kerala, Maharashtra, Gujarat, Orissa and West Bengal. These states have an active fishermen population of over 2 lakhs, the highest being in Kerala (74,241) and lowest in Karnataka 6,357. In between these two states lie Tamil Nadu, 56,586; Andhra Pradesh, 47,7000; Maharashtra, 20,698; Gujarat 11,736; and less in Orissa and West Bengal.

State	Approx. length of coastline (in kms)	No. of fishing villages	No. of landing centres	Percentage catch of each state to the total India catch
1. Andhra Pradesh	970	321	353	7.22
2. Tamil Nadu (Incl. Pondicherry)	960	363	361	14.78
3. Kerala	560	279	213	38.58
4. Karnataka	270	131	98	9.00
5. Gujarat	1,500	256	107	7.36
6. Maharashtra	600	265	179	18.73
7. West Bengal and Orissa	680	182	15	2.36
8. Goa	110	—	—	1.82
9. Andamans	—	—	—	0.05
10. Laccadives	—	—	—	0.10
Total	5,650	1,797	1,256	100.00

(C.M.F.R.I. 25 years of Marine Fisheries Research 1947-72)

Importance of Fisheries

The fishing industry in India is gradually passing through an initial phase of changing over from traditional to the modern method of exploitation. The number of mechanised craft increased from about a dozen in 1951 to about 5,000 in 1967, to about 8,000 in 1971 and to about 12,000 in 1977. With increased use of mechanised fishing crafts, there has been an increase in the marine fishing landings from 533,916 metric tonnes in 1951 to 1.15 million tonnes in 1971 and to 2.40 million tonnes in 1976-77. The number of country crafts approximates about 1 million and are engaged in fishing activities all along the Indian coast and provide gainful employment to not less than 3 million people ; besides hundreds of unskilled labour. Thousands of trucks, refrigerators, vans and cars provide employment to significant number in transporting fish and other marine products from sea coast to internal consuming centres.

Production, Consumption, Trade etc.

Since Independence India has emerged as one of the main exporters of canned and frozen fishery products such as frozen pomfrets, sardine, prawns, lobster tails, frozen frog legs, canned shrimps, shark fins, fish maws, dried fish. These products are by and large absorbed in U. S. A., Japan, U.K., France, West Germany, Australia, West Indies Islands. The total foreign exchange earned from exports of sea food increased from Rs. 58,000 in 1953-54 to Rs. 60 crores in 1972-73 and to Rs. 189 crores in 1976-77. The shipments to these countries are done under Export (Quality Control and Inspection) Act, 1963. This Act requires preshipment inspection of fish and fishery products through network of Inspectorates and Laboratories situated at Vishakapatnam, Madras, Cochin, Calcutta, New Mangalore, Cuttack, Tuticorin, Quilon, Alleppy, Calicut, Goa and Bombay. Although India ranks sixth among the fishing nations of the World (preceded by Peru, Japan, USSR, Norway, and USA). the per capita consumption of fish is probably the lowest in the world, being only about 4.13 kg. per year, as against 15 kg. in America, 21 kg. in U.K., and 40.8 kg. in Japan. According to N.S.S. about 60 p. c. of the country's population is fish-eating. West Bengal is the leading consumer having 3 kgs. fish per capita, in the Punjab it is only 0.5 kg. and in Bihar 1 kg.

One half of the total production is consumed as fresh ; one-fifth is cured by salting, another one-fifth is simply sun-dried, while about 10 p.c. is converted into fish fertilizers.

Sources of Fish

The chief sources of supply of fish are the coast margins of the sea, river estuaries and backwaters for marine and estuarine fish and rivers, canals, tanks, inundated tracts, etc. for the fresh water fish.

Of the total fish production about 70 p. c. is from the sea and 30 p. c. from the fresh water areas.

Production of Fish in India (Thousand tonnes)¹

Year	Marine	Inland	Total
1949	387	159	546
1951	534	218	752
1956	718	294	1,012
1961	684	277	961
1966	890	477	1,367
1971	1,162	690	1,852
1972	964	666	1,640
1973	1,210	748	1,955
1974	1,521	804	2,325
1975	1,755	865	2,620
1976	1,520	880	2,400
1977	1,600	940	2,540

Inland Fisheries constitute fresh fish from rivers, canals, tanks, ponds, irrigation channels, inundated tracts, etc. They are the mainstay of inland fisheries of India. The extensive areas of Ganges system, Brahmaputra in Assam, Mahanadi in Orissa ; Narmada and Tapi in M. P., Godawari, Krishna and Kavery in South India are the main areas for inland fisheries. In this class of fish, West Bengal leads the rest of India. The three States of West Bengal, Bihar and Assam account for 72 per cent of the total fresh water fish in India.

The production of inland fish has increased from 2.2 lakh tonnes in 1951 to 2.8 lakh tonnes in 1961 ; to 7.8 lakh tonnes in 1973-74 and to 8.8 lakh tonnes in 1977-78. But the potential estimated at 3.5 m. tonnes is yet to be tapped. Cultivable area of 10 m. hectares of inland water surface is available in India of which rivers and canals account for 40 per cent, tanks, reservoirs and lakes about 30 per cent, brackish water swamps 15 per cent and estuaries another 15 per cent. But of this only 1.6 m. hectares of waters are cultivable, of which 0.6 m. hectares were utilised in 1965 and 0.4 m. hectares went untapped for want of fish seed, and the remaining 0.6 hectares were yet to be reclaimed.

Sea Fishing. Sea fishing is mainly carried on in small craft having a displacement of under five tonnes, in coastal waters from five to seven miles from the shore and within a depth of 10 fathoms. With the exception of a few offshore boats operating in certain localities, very few fishermen make voyages which would entail staying in the open sea longer than 12 hours at a time. There is, at present, practically no night fishing. This is largely because the equipment used for sea fishing consists mostly of boats, canoes, catamarans and of small nets and tackles which are not of a type which can stand the rigours and requirements of off-shore or deep-

1. *Indian Agriculture in Brief* 1,974, p. 107 India, 1975, p. 180
Indian Agriculture in Brief 1977

sea fishing. These fishing people, poor as they are, have acute problem of procuring nets, timber for boats, sailing cloth, fish hooks and coal tar, etc. So the mechanisation of fishing operation has become an absolute necessity.

At present sea fishing is carried on within a depth of 20 meters in the sea. The sea fisheries are confined to coastal waters from the shore of Gujarat, Canara, Malabar Coast to Gulf of Manar, Tamil Nadu coast, Coromondal coast. Studies carried out by the Central Marine Fisheries Research Institute located at Cochin (with the assistance of UNDP-assisted Pelagic Fisheries Projects), with 8 sub-stations in different coastal areas have indicated that about 4 lakh square kms. fishable marine area, only 25 per cent is being fished. The Indian Ocean can yield at least 14 million tonnes of fish annually against the present yield of 2.7 m. tonnes. It is possible to double the annual marine fish catch to 2.4 m. tonnes provided fishing is extended to depths upto 200 meters. Of this potential catch, about 1.6 m. tonnes would be from the West Coast and 0.8 m. tonnes from the East Coast.¹

Fish landings on the east coast are considerably smaller than on the west coast of India. Changing economics of operations, over-exploitation of inshore stocks, availability of new stocks in off-shore and deep sea areas, the supply of large scale trawlers for operation in these areas, heavy investments involved in reclamation of water areas for inland fish culture are the features which have their bearings on fish production.

Estuarine and Backwater fishing. Chilka lake in Orissa and backwaters in Tamil Nadu, Kerala, deltaic areas of Sundarbans and Mahanadi are the principal sources of estuarine and backwater fish. The estuaries of Mahanadi and the Ganges stretching from Puni to Hooghly are extensive fishing grounds containing hilsa, pom frets, prawns, catla, cat fish, rohu, etc.

Varieties of Fishes

More than 1,800 distinct species of fish are known to exist in the seas around the country and the inland waters, but the varieties that are caught in appreciable quantities are limited in number. Pisciculture experts classify the commercially important varieties of sea fish into 15 groups and freshwater fish into eight.

The sea fish groups include elasmobranchs, eels, cat fishes, silver bar fish, herrings and anchovies, Bombay duck mackerels and perches, silver bellies, flat fishes, mullets, Indian salmon (which is stated to be not a true salmon) jew fish, crustaceans and minor shell-fishes. Mackerels account for about one-third of the total catch. Herrings account for over 15 p. c. ; and Prawns about 9 p. c and the rest is accounted for by other varieties.

Freshwater fishes are grouped under cat-fishes, mullets, carps, prawns, murels, feather backs, eels, herrings and anchovies. Though several kinds of edible fish are obtained from fresh water sources,

1. *Economic Times*, 15th Dec, 1975.

only a fraction of the inland water area is devoted to planned pisciculture.

Regarding fresh water fishes, carps form the most highly esteemed variety, constituting about 34 per cent such as *Rohu*, *Catla*, *Mrigal* and *Calbas* which are well known throughout India. Other important varieties are cat fish, wallgo, bargarious, clarius, silundia and macrones belonging to this class. Trout has been introduced into the hill streams in Kashmir, Kumaon and Nilgiri Hills.

Regarding river fishes, the following may be specially mentioned—*masheer* available in the upper reaches of most rivers in India. *Chilwa* is a flat-sided, thin-bodied fish with his stomach running an edge. It occurs freely both in the north as well as in south Indian rivers. *Marrel* varies from 2 to 3 ft. in length. *Batchwa* is small but excellent for eating. *Barils* have 14 species and they are widely distributed throughout India. *Olive carp* is available in Madras and is also found in the fresh waters all along the coast of India from Kutch to Bengal. *Mulley* has no scales.

Regarding tank fishing we have *Rohu* which is met within most large-sized tanks.

Fisheries Development Programmes

Fisheries development programmes fall into two parts : marine fisheries and inland fisheries.

Schemes for the former consist of : (i) mechanisation of fishing craft, (ii) exploratory and experimental fishing to locate new grounds, (iii) improvement of fishing methods, (iv) increasing the supply of fishery requisites, and (v) provision of facilities for landing, preservation, transport and marketing of fish.

Mechanisation of fishing craft and development of suitable designs of mechanised craft for different coastal regions was undertaken since 1951 so that by 1977-78 there were about 14,400 mechanised boats.

Survey of marine resources for locating fishing grounds for the off-shore and deep sea areas is being intensified. Exploratory and experimental fishing is being carried out from 12 bases in the country. A UNDB-assisted pelagic fisheries project is assessing the resource of surface waters in the Goa-Cochin sector. About 80 fishing vessels are now operating in the off-shore and deep sea areas.

To stimulate deep sea-fishing, infra-structural facilities are being provided at various major and minor ports. Fishing harbours have been constructed at Veraval, Jaffarabad, Novabander, Porbander, Umergaon, Karwar, Bhatkal, Gangoli, Baypore, Cochin, Madras Ratnagiri, Honnavar, Dhamra, Malpe Mallipatnan, Kodia-karai Kakinada, Mangrol Cannanore, Baliapatnam, Vizhinjam, Tuticorin, Cuddalore, and Calcutta. 13 self-contained fishing barges are under construction. Landing and berthing facilities are provided at 70 sites.

In order to get best results for traditional non-mechanised and coastal mechanised fishing inputs needed are development of craft material, improved designs of boats, provision of storage facilities, use of out board motors, improved sails, marine gear, provision of credit facilities for the purchase and operation of improved boats, establishment of fully equipped service stations and workshops and improvement in operational efficiency.

Marketing, processing and storage of fish is also very important. If fish is frozen and canned it may increase the earnings of fishermen than what the fresh and simply dried fish can fetch. For this fish storage and ham plants, large ice plants and for fishmeal and oil extraction, refrigerated rail vans and road transport will be required. Extension should also be made of improved techniques of freezing, filleting, handling, salting and dehydration of fish.

For the development of deep sea fisheries, it is necessary to ascertain the behaviour of the water by studying the physical, biological and chemical aspects of oceanography.

Schemes relating to the development of inland fisheries aim at increasing production through survey, introduction of fish culture techniques, investigation of fish seed resources, development of reservoirs, fisheries and marketing.

Better potential for increasing fish yield exists in reservoirs and lakes and also private tanks. Introduction of quick growing varieties of Carps allowing them a suitable period of growth before exploitation and conservation measures, cleaning of tree shrubs and provision of fish ladders are made for this purpose.

Yield can be stepped in tanks if fish seeds are supplied at reasonable prices, pumps are supplied for dewatering and technical knowledge is supplied for desilting and intensive fish culture.

Fish seed may be spawn, fry or fingerling. Incentives may be given to the fishermen from whom spawn can be bought for stocking in reservoirs. Direct link may be established by the Government between spawn producer and fry-rearer to whom facilities like credit for construction of nurseries, supply of spawn rearing equipments are supplied. Production of spawns and fingerlings has reached a level at 18.18 crores and 4.83 crores in 1973-74. The total nursery area now available for spawn rearing is about 925 hectares. Brackish water swamps may be exploited for fisheries if reclamation of derelict water, provision of communication and research into promotion of suitable seed material is done.

Although vast fishery resources exist in and around the coastal waters, yet they have been under-utilised. Indian fishing is confined to narrow coastal belt. The rich deeper waters have remained untapped. Investigations by CMFRI, which serves as the marine fisheries data centres, have indicated extensive stocks of shrimps in regions 150-160 fathoms off the south-west coast. The catch of oil sardine and mackerel along the west coast can also go up substantially if fishing is done by mechanised boats during the off season May to October, when the shoals move further off-shore.

A resource practically untouched is anchovies, of which there are at least half a million tonnes off the southwest and southeast coast that can be fished every year. There is also good scope for increased exploitation of prawns along the East Coast and the Gujarat coast. There is a high potential for squids and cattle fish especially along the southwest coast and in the Bay of Bengal. The highly rich tuna resources of the high seas remain practically unexploited, because this would need trawlers capable of remaining at sea for days together. Moreover, most of India's 10,000 small mechanised boats—about 8,000 are functional—are illequipped for deep-sea fishing, and these account for nearly 35 per cent of the total marine catch.

Fishery Development During Fifth Plan

During the Fifth Plan, the principal objectives in respect of fisheries development would be : (a) to intensify fish production ; (b) to improve socio economic conditions of fishermen and to increase the employment potential of this sector ; and (c) to improve the system of marketing of fish and fisheries products in the domestic market.

To achieve these objectives, the Fifth Plan proposes to increase output of inland fish from a level of 7.84 lakh tonnes in 1973-74 to 12.55 tonnes in 1978-79 ; two thirds of this increase will come from adoption of intensive fish culture methods in the water areas already under fish culture ; and from increase yield by 300 kg/ha to 900 kg/h. 0.5 lakh hectares would be reclaimed to give an additional production of about 0.9 lakh tonnes. Nursery area for fish seed production would be expanded and Fish Farmers' Development Agencies established in selected districts.

The output of marine fishery will increase from 14.85 lakh tonnes to 20.55 lakh tones, through 4000 additional mechanised boats (total 13,300) and 200 additional large fishery vessels and construction of harbours, processing plants, transport systems, etc. Fishing harbours will be completed at major ports like Madras, Bombay, Cochin, Roychak, Vishakhapatnam and Pradeep.

In the Draft Five Year Plan, the target for fish production has been placed at 5.6 million tonnes. Infrastructure facilities for improved handling, storage and processing of catches, and development of berthing and launching facilities for fishing vessels shall be undertaken. As regards off-shores and deep sea fishing, priority would be given to research and commercial surveys and experimental fishing for making fishing resource assessment and to chart and map potential fishing grounds to facilitate and promote investments in deep-sea fishing.

In view of the serious food shortage, it is imperative to exploit our water resources to the maximum possible extent to provide us with fishfood. "Earnest efforts in this direction could soon turn an armchair fantasy, of vast reservoirs and endless canals teeming with fish all over the country into a common place reality. A granary for the people and a gold mine for government await in large rivers and rich storage projects of the country."

Appendix I
Cattle Wealth in Some Important States, 1972
(In Thousands)

State	Cattle	Buffaloes	Sheep	Goats	Pigs	Total Livestock	Poultry
Andhra Pradesh	12,525	7,028	8,251	4,308	24	32,876	18,872
Bihar	14,911	3,679	983	7,364	879	27,946	12,560
Kerala	2,835	475	29	1,411	1	4,882	11,073
Gujarat	6,536	3,610	1,764	3,241	5	15,418	3,017
M. P.	26,392	5,789	1,011	6,133	342	39,883	6,735
Maharashtra	14,697	3,269	2,106	5,849	197	26,232	17,834
Rajasthan	12,470	4,592	8,556	12,162	111	38,878	1,235
Nagaland	93	10	—	18	184	335	703
Punjab	3,606	4,067	436	890	38	9,295	1,680
Haryana	2,552	2,518	459	478	143	6,290	963
H. P.	1967	488	1,016	796	2	4,300	178
Karnataka	10,134	3,289	4,827	3,788	280	22,424	10,315
Tripura	525	20	2	147	44	738	518
Orissa	11,769	1,409	1,438	2,984	378	18,040	7,973
Jammu & Kashmir	2,057	493	1,072	569	1	4,285	1,654
U. P.	26,145	12,581	1,956	6,595	1,302	49,099	3,983
Total India	127,868	34,678	39,993	67,518	6,900	353,338	138,544

Appendix 2

**Planned Capacity and Average Daily Throughput of Main Dairy
Plants in Operation in Public Co-operative Sector as at the
End of January**

State/U.T.	Dairy Plants	Dairy installed Capacity (in litres)	% age throughput against installed capacity
1	2	3	4
Andhra	1. Hyderabad	80,000	95.5
Pradesh	2. Kurnool	2,000	44.2
	3. Nellore	5,000	74.0
	4. Visakapatnam	10,000	84.7
	5. Chittor	10,000	48.4
	6. Rajamundri	10,000	97.0
	7. Warrangal	1,26,000	63.1
	8. Vijayawada	1,25,000	88.6
Assam	9. Gauhati	10,000	66.5
Bihar	10. Bhagalpur	1,000	36.0
	11. Gaya	8,000	17.4
	12. Patna	10,000	94.2
	13. Ranchi	6,000	60.3
	14. Barauni (Creamery)	2,000 kg.	54.4
	15. Barauni (milk power factory)	1,00,000	6.0
	16. Darbhanga	6,000	27.9
Chandigarh	17. Chandigarh	20,000	139.1
Delhi	18. Delhi milk Scheme	2,55,000	113.7
Gujarat	19. Rajkot	45,000	37.8
	20. Mehsana	3,50,000	68.8
	21. Anand	5,00,000	113.7
	22. Ahmedabad	1,00,900	142.3
	23. Bhavnagar	4,000	44.5
	24. Surat	50,000	117.7
	25. Baroda	1,00,000	70.0
	26. Junagadh	10,000	2.4

1	2	3	4
Goa	27. Ponda	10,000	53.5
Haryana	28. Jind	50,000	87.6
	29. Bhivani	15,000	56.7
	30. A. Ambala	20,000	
	31. Mandi	17,000	48.4
Himachal Pradesh			
Jammu & Kashmir	32. Srinagar	10,000	15.3
	33. Jammu	10,000	43.4
Kerala	34. Calicut	6,000	91.8
	35. Trivandrum	6,000	159.7
	36. Ernakulam	10,000	53.3
	37. Palghat	6,000	76.2
Tamil Nadu	38. Kottayam	6,000	63.5
	39. Coimbatore	16,000	119.4
	40. Kodaikanal	1,000	125.0
	41. Madurai	50,000	46.1
	42. Madras	75,000	117.7
	43. Kanyakumari	3,000	179.6
	44. Tiruchirapalli	16,000	43.1
	45. Tanjavour	16,000	26.5
	46. Chidambaram	5,000	9.4
	47. Dhulia	80,000	134.9
Maharashtra	48. Bombay	6,00,000	90.4
	49. Kolhapur	20,000	203.4
	50. Nasik	12,000	80.4
	51. Nagpur	20,000	161.1
	52. Poona	1,00,000	64.9
	53. Sholapur	10,000	133.0
	54. Miraj	40,000	106.3
	55. Aurangabad	5,000	116.9
	56. Imphal	4,000	30.0
	57. Bhadrawati	10,000	29.4
Mysore	58. Bangalore	50,000	160.4
	59. Kudigee	4,500	55.8
	60. Hubli Dharwar	10,000	145.3
	61. Gulbarga	10,000	53.6
	62. Belgaum	10,000	42.2
	63. Mangalore	10,000	54.7

1	2	3
	64. Devagre	6,000
	65. Mysore	10,000
Madhya	66. Indore	20,000
Pradesh	67. Jabalpur	10,000
	68. Bhopal	10,000
	69. Gwalior	10,000
Orissa	70. Cuttack	6,000
Punjab	71. Amritsar	65,100
Pondicherry	72. Pondicherry	10,000
Rajasthan	73. Jaipur	20,000
Tripura	74. Agartala	5,000
U. P.	75. Agra	6,000
	76. Allahabad	5,400
	77. Almora	3,000
	78. Haldwani	3,000
	79. Mathura	10,000
	80. Lucknow	40,000
	81. Dehradun	20,000
	82. Varanasi	1,800
	83. Gorakhpur	10,000
	84. Kanpur	50,000
	85. Aligarh	1,000 kg.fat
	86. Moradabad	55,000
West	87. Calcutta	2,00,000
Bengal	88. Durgapur	55,000

14.

Agricultural Labour

One of the most disquieting features of the rural economy of India has been the growth in the number of agricultural workers—cultivators and agricultural labourers—engaged in crop production. The phenomena of under employment, under-development and surplus population are all simultaneously manifested in the daily lives and livings of agricultural labourers. They get unusually low wages, conditions of work put an excessive burden on them and employment which they get is extremely irregular. What Dr. Pattabhi said in 1940 still holds true. Speaking at the Agricultural Labourers' Conference he said : "The cultivator who spends the day between slush and mud, who works now with a starving stomach and now with a half-appeased appetite, who knows no rest in storm or sunshine, who often-times has no dwelling site which can be called his own, he grows our paddy but starves. He feeds our milch cows but never knows anything beyond *kanjee* and water. He digs our wells but must keep off from them when they are full. He is a perpetual hewer of wood and drawer of water for those who fatten on his labour and rise to wealth and plenty. His condition is appalling and heart-rending." It was this condition that led the Agrarian Reforms Committee, 1950, to observe that "to leave out problem of agricultural labour in any scheme of agrarian reforms as has been done so far—is to leave unattended a weeping wound in the agrarian system of the country."

In view of the over-riding concern to the problems of agricultural labour that the Prime Minister had stated in 1966 that "... we must give special consideration to landless agricultural labour. Although there has been tremendous progress in India since Independence, this is one section which has really a very hard time and which is deserving of a very special consideration."¹

Growth in the Number of Agricultural Labour

The number of agricultural proletariat has increased tremendously during the last 90 years. The Census Report for 1881 put the total number of landless agricultural workers at 7.5 million. This

1. Excerpts from Prime Minister's Speech made in Lok Sabha on August 4, 1966.

number increased to 18.7 million in 1891, to 21.6 million in 1921 and to 29.9 million in 1931. According to 1961 census, the total number of persons engaged in agriculture was 131 million, of whom 99.5 million were cultivators and 31.5 million agricultural labourers. The corresponding figures for 1951 were 69.8 million and 27.5 million respectively—totally to 97.3 million persons. In 1971, there were 78.6 million cultivators and 47.5 m. agricultural labourers. It will be observed that a big shift has taken place from cultivators to agricultural labour. As against 53 per cent of the total working force returned as cultivators in 1961, the corresponding proportions in 1971 stand at 43 per cent. On the other hand, among agricultural labour, the 1961 proportion was 16.7 while in 1971 it shot up to 26.3 per cent. It does not mean that a number of persons who were cultivating land in their own right as cultivators in 1961 were dispossessed of their land and now became landless agricultural labour. But the fact was that for the purpose of economic activity, persons recorded them as cultivators : whereas in several cases, persons were basically agricultural labourers.

It may be noted that the proportion of agricultural labourers to the total labour force of the country was 16.9 per cent in 1901, 17.4 per cent in 1921, 19.7 per cent in 1951, 16.7 per cent in 1961 and 26.3 per cent in 1971. In view of the differences in assumptions, definitions etc. adopted in various censuses, these statistics are not strictly comparable, but nevertheless they do indicate the rapidity with which the number of agricultural labourers has increased.

Increase in Agricultural Labourers and Others
(In millions)

Category	1911	1921	1931	1951	1961	1971
1. Total workers	121.4	117.9	120.6	193.5	188.6	180.5
2. Cultivators	60.5	64.1	54.3	69.8	99.5	78.3
3. Agricultural labourers	25.0	20.5	29.9	27.5	31.5	47.5
4. (2) as percentage of (1)	49.8	54.4	45.0	50.0	52.8	43.4
5. (3) as percentage of (1)	20.6	17.4	24.8	19.7	16.7	26.3
Number of agricultural labourers per 100 cultivators	41	32	55	39	32	60

The proportion of agricultural labourers to total working force varied from 82.3 in Bihar to 74.2 in Rajasthan in 1971. In states like Andhra Pradesh, Kerala, Maharashtra, Orissa, Tamil Nadu, West Bengal and M. P. the proportion was 70.0 ; 48.5 ; 64.4 ; 77.4 ; 61.7 ; 58.4, 79.4 respectively.

According to the 1971 population census, the country's rural population was estimated at 439.1 million. In the eighteenth Round of N.S.S (covering 1963-64), the average size of the rural household has been estimated at 5.14 and on the assumption that the household size would not have changed significantly during the interregnum, the number of rural households in 1971 may be estimated at 85.38 million. Again, according to the 18th Round of the N.S.S., the percentage of agricultural labour households to the total rural households was 23.9. Applying this percentage to the number of agricultural labour households (i.e. 85.38 million), the number of agricultural labour households in 1971 may be estimated at 20.41 million or say 20 million. According to N.S.S. enquiries (in 1956-57 and 1963-64) about 60 per cent of the labour households had no land. Accordingly, the number of landless labour households may be put at 12 million. This would indicate the magnitude of the problem facing the country so far as agricultural labourers are concerned.¹

It may be noted that the problem of landless labourers is more acute in Bihar, Andhra Pradesh, Kerala, Maharashtra, Tamil Nadu and Orissa, where ryotwari and zamindari systems prevailed.

Causes of Growth of Agricultural Labour

The causes operating to bring about the growth of this class may be broadly summed up as follows :

- (i) high net growth rate of the population in the country ;
- (ii) growth of indebtedness due to low income leading to transfer of land from the small owners to the creditors, resulting in the former into becoming agricultural labourers ;
- (iii) displacement of means of subsidiary occupations whereby existence solely on an uneconomic unit of land becomes impossible ;
- (iv) growth of absentee landlordism ;
- (v) the extension of money economy to rural areas in replacement of payment in kind.
- (vi) disintegration of village communities of the pre-nineteenth century ;
- (vii) decline of domestic industries and handicrafts ;
- (viii) disintegration of the peasantry ;
- (ix) a severe agricultural depression in the late twenties ; and
- (x) other social factors such as economic transition through which some of the criminal tribes and castes have been passing.....all these led to the emergence of a class of landless labourers in the country.

1. National Commission on Agriculture, *Interim Report on House Sites for Landless Agricultural Labourers*, 1972, p. 8.

In this conception the observation of Dr. Mukherjee seems right. He says, "Every circumstance which has weakened the position of the small holder has increased the number of agricultural labourers, viz., the loss of common rights in the rural economy, the disuses of collective enterprise, the sub-division of holdings, the multiplication of rent receivers, free mortgaging and transfer of land followed by a decline in cottage industries."¹ Besides, change in proprietary rights, among the tribal people also brought about a change in their position and converted them from tenants to landless labourers. This has happened to the *Gonds* and *Bhils* of M. P., the *Korwas* of U. P. and the *Mundas* of Chhota Nagpur.²

Definition of the term "Agricultural Labour"

It is rather difficult to define the term "agricultural labour" in precise terms. However, it will be useful to refer to some of the attempts made by experts in this connection. The *First Agricultural Labour Enquiry Committee* (1950-51) defined this as "those people who are engaged in raising crops on payment of wages." The *Second Agricultural Labour Enquiry Committee* (1956-57) enlarged the definition of agricultural labour to include "those who are engaged in other agricultural occupations like dairy farming, horticulture, raising of livestock, bees, poultry etc."

In the context of Indian conditions the definition is not adequate because it is not possible to completely separate those working on wages from others. There are people who do not work on wages throughout the year but only for a part of it. Therefore, the first A.L.E.C. used the concept of 'agricultural labour household'. If half or more members of a household have wage-employment in agriculture then that household should be termed as 'Agricultural labour household.' This concept was based upon the occupation of the worker. But the second A.L.E.C. substituted income criteria and said that an 'agricultural labour household' is one whose main source of income is wages from agriculture.³

According to the *National Commission on Labour*, an agricultural labourer is one "who is basically unskilled and unorganised and has little for its livelihood other than personal labour." Thus, persons whose main source of income is wage employment fall in this category. It consists of two sub-categories : (i) landless agricultural labour, and (ii) very small cultivators whose main source of earnings, due to their small and submarginal holdings, is wage employment. Landless labour in turn can be classified into two broad categories : (a) permanent labour attached to a cultivating household, and (b)

1. R. K. Mukerjee, *Land Problems of India*, 1930, p. 215.

2. R. K. Mukerjee, (Ed.), *Economic Problems of Modern India*, Vol. I, 1939, p. 42.

3. *Labour Yearbook*, 1960 (1961), p. 316.

casual labour. The second group can again be sub-divided into three sub-groups : cultivators, sharecroppers, and lease holders.¹

Permanent or attached labourers generally work on annual or seasonal basis and they work on some sort of contract. Their wages are determined by custom or tradition. On the other hand, *temporary or casual labourers* are engaged only during peak period for work.² Their employment is temporary and they are paid at the market rate. They are not attached to any landlord.

Under the second group come *small farmers* who possess very little land and, therefore, have to devote most of their time working on the lands of others as labourers. *Share-croppers* are those who, while sharing the produce of the land for their work, also work as labourers. Tenants are those who not only work on the leased land but also work as labourers.

The Agricultural Labour Enquiry Committee differentiated between the "attached" and "casual" labourers. The former are those who are employed for a period of time i.e., on annual or seasonal basis by the assignment of lodging on the farm, who are under some sort of contract with the employers, and in whose case the mode of payment is determined by custom and tradition. They are to work for their employers and are not ordinarily free to seek employment elsewhere, while the latter i.e., the casual are engaged in peak period and attend to rush work only. Such labourers are free to leave one job for another whenever they please and they are paid at the market rate.³ In most cases, the difference between the two classes is stated initially in terms of period for which a man is engaged and whether or not he receives daily wages. For example, in Assam, "attached" workers were employed and paid on a monthly basis, or annual basis, while "casual" workers were paid daily wages for short period during busy seasons.⁴ In Madras, "attached" workers "were engaged for the whole year or during the busy season for a period of three to six months" ; casual workers being "engaged either on time or on piece rates".⁵ In PEPSU "casual" workers were paid on a daily basis while "attached" workers were generally

1. *Report of the National Commission on Labour*, 1969, p. 392 .
2. *The Congress Agrarian Reforms Committee* classifies agricultural labourers into three groups, viz., (i) field labourers, (ii) ordinary labourers ; and (iii) skilled labourers, (i) The *field workers* include ploughmen, reapers, sowers, weeders and transplanters. Majority of these are engaged in seasonal type of work ; but some almost these are employed all the year round, (ii) *Ordinary labourers* are employed in building embankments, digging, silt clearing and other like jobs (iii) The *skilled labourers* include carpenters, masons, blacksmiths, and others who are employed by cultivators on the same rates as agricultural labourers—*Report*, pp. 114-115.
3. *Report of the Intensive Survey of Agricultural Labour*, Vol. I, 1955, p. 22 and *Agricultural Wages in India*, Vol. I, p. 400.
4. *Agricultural Wages in India*, p. 55.
5. *Ibid.*, p. 11.

employed for longer periods on yearly, half-yearly or monthly agreements.¹ In the case of Bihar, on the other hand, "a striking feature of agricultural employment... was the payment of daily wages both to casual and attached workers."² Similarly, in Rayalseema area "some of the attached workers got daily wages even though the contract of employment was casual"³.

According to the First Agricultural Labour Enquiry (1950-51), 90 per cent of the total agricultural labour families were 10 per cent attached and 90 per cent casual workers. The corresponding figures for the Second Enquiry (1956-57) are 27 and 73 respectively.

The percentage of agricultural labour in rural population was 30.4, of which 50 per cent were without land at the time of first enquiry. During second enquiry these figures were 24.5 per cent and 57 per cent respectively.

Agricultural Serfs

At the bottom of the agricultural ladder in India are those labourers whose conditions are not very different from those of serfs. Agricultural serfdom has been most prevalent in those parts of India where the lower and depressed classes are most numerous. The ethnic composition of the village, which governs the social stratification, is responsible for the survival of the slavish conditions. Thus in Gujarat, Maharashtra, Kerala, Tamil Nadu, Malabar, M. P., Central India and Chhota Nagpur, a large aboriginal population lives and the condition of this agricultural labourer is very much like that of a slave. An official report describes serf labourer in the following terms : "The average agricultural labourer is not infrequently compelled in time of stress to mortgage his personal liberty. In return for a small sum of money which he may happen to need at the moment, he agrees to serve the man from whom he has borrowed. The money is not repaid, nor is it intended to be repaid, but the borrower remains a lifelong bond slave of his creditors. For his work he merely receives an inadequate dole of food and to all intents and purposes is in the position of a medieval serf." This agrarian serf labour is regularised in such a manner that some of the regions have special name for it, e. g., *Hali* in Gujarat ; *Kaimuti* in south Bihar, *Harwais* and *Barmasias Janouri* in north Bihar ; *Gothi ehakar*, *Muliyas* or *Nag-Muliyas* in Orissa ; *Pannial-athiram* in Tamilnadu ; *Gassigullu* and *Palerus*, *Bhagia* in Andhra Pradesh ; *Sanwak* and *Hariaps* in Oudh ; *Harwah Bassalia* and *Shalkaris* in M.P., *Feethan* and *jeetha* in Karnataka *Halyas* and *Chyoras* in Kumaon ; *Sewak* and *Haris* in U.P. ; *Padial* in east Tamil Nadu *Dublai Kolis* in Maharashtra ; *Sagari* in Rajasthan. *Adiammars* and *Cherumes*, in Kerala, *Holys* in South Kanara : and *Seri* or *Sanji* in

1. *Ibid.*, p. 247.

2. *Ibid.*, p. 68.

3. *Ibid.*, p.p. 120, 151, 165 and 182.

Punjab.¹ These serfs had to serve in their master's household. They received money for their marriage expenses on an undertaking to serve till they paid off their debts. During the course of employment they were fed and clothed by their masters.

In the east coast of Tamil Nadu, similarly, many of the agricultural labourers were *Pariahs* who were known as *Padials*. The *Padial* was a serf who fell on hereditary dependence on a landowner from whom he borrowed money. Since such loans were never repaid the *Padials*, being attached to the soil, had to go with the land when it was sold or the owner died.

In Orissa, there were three kinds of labourers : (1) The *Chakar* or *Baramasiya* labourer engaged for 12 months with board and lodging and Rs. 24 in cash. His ancestor may have obtained a loan from his employer. (2) The *Naga Muliya*, who also worked as a yearly servant, but received instead of board and lodging 4 seers of paddy and a plot of land to cultivate free of rent, (3) The *Danda Muliya*, who was employed for a short period on specified wages. In Bihar, there were the *Kamias* or bond-servants who having borrowed money, bound themselves to perform whatever menial services were required of them by their masters. These depressed castes, who have no land or security pledged their labour, whenever they wanted a loan ; and not only their labour but that of their dependents also. Very often it happened that the joint wages of the *Kamia* and his wife were not sufficient to feed them and their children.²

In south Gujarat *Halis* served their creditors from year to year being unable to pay the loan during their lifetime. The *hali* had been called an indentured labourer, a freeman *de jure* but a serf *de facto*. The region of the Tapti river had about a lakh of serfs. They went on drudging from year to year and effected an escape from the drudgery either by death or by running away to a distant place from their village.³

A number of surveys have been conducted in selected areas by the Commissioner for Scheduled Castes and Scheduled Tribes and other agencies, throwing light on the pattern of bonded labour and the variations therein. For instance, a survey conducted in 1964 in Pujariguda, Telengaguda and Pathamunda villages in the Nowrangpur block and Ranganatigunda village in Koraput district of Orissa revealed that once a person borrowed money he had to work as a field labourer as well as a domestic servant virtually for the whole of his life. Named as "*gothi*" the bonded labourer would be required to pass on his liabilities to his son who would become a "*gothi*" after the death of his father. This was because the creditor

1. National Commission on Labour Report, p. 409.

2. Agricultural Labour Enquiry Committee Report, Vol. I, p. 45.

3. Bombay Census Report, 1921, Pt. I, p. 20.

would give only food and occasional clothing to the "gothi". Since the "gothi" did not get any money for his labour, he was in no position to repay the debt which went on mounting with arbitrary compound interest.

According to another study made in 1965 in Dungarpur tehsil of Rajasthan, the victims of this practice, called "sagris", had to volunteer for serfdom because their total monthly income was between Rs. 4 and Rs. 25. The average loan taken by "sagri" families was Rs. 679. A substantial part of the loan (41 percent) had been borrowed for marriage purposes. The rest of the amount was taken to meet household expenses, buy agricultural implements and clear old debts.

A special feature of the Dungarpur practice was that only one or two dates in a year had been prescribed by a money-lender for clearing the whole debt. The "sagri" was not allowed to repay the entire money on any other date. This helped the money lender keep the "sagri" in perpetual or prolonged bondage.

A survey of "Paniyans" ('bonded labourers' in Cannanore and Kozhikode districts of Kerala) revealed that 43 per cent of the households had been working as bonded labourers as they had borrowed Rs. 25 to Rs. 50 from their creditor-masters. With certain variations, the system was prevalent in Andhra Pradesh and Karnataka where the bonded labourer was called "jeetha". The Andhra Pradesh study was made in 1965, while the Karnataka survey was conducted in June, 1974.

Though the bonded labour system was prevalent in such States as had pockets of Adivasis this 'barbarous practice' did not exist in Meghalaya, Mizoram, Nagaland and Arunachal.

Rural Labour Market

According to the first A. L. E., the percentage of agricultural labour in the rural population was 30.4 of which 50 per cent were without land i. e., the proportion of landless labourers was 15 per cent of the rural population, 85 per cent of the agricultural labourers had only casual work. The second A. L. E. revealed that the percentage of agricultural labour households was 24.5 of which about 57 per cent were without land i. e., about 14 per cent of the rural households did not have any land. Casual agricultural labour households accounted for 73 per cent of all agricultural labour households. According to the Rural Labour Enquiry Committee (1964-65), the number of agricultural labour households was 22 per cent of all rural households. About 56 per cent of such households had no land.

The demand for labour in agriculture is highly seasonal and uneven due to the seasonal nature of agricultural operations. There is a peak demand for labour in the harvesting seasons and next to

that in times of transplanting and weeding. The duration of employment in a year varies from 5 to 7 months in dry areas and 9 to 10 months in irrigated areas. The number of labourers in demand depends upon the size of holdings, and the nature of cultivation or the crops raised, e.g., in the Kanam tract of Gujarat, for a farmer with a holding of 25 bighas producing tobacco, cotton, jowar, tur and a few other pulses and with members of the family to work in the fields, there was no demand for hired labour. But on the other hand, in the holding of equal size in Surat, the owner required paid labour.

Men are required mainly for operation of ploughing, levelling, digging wells and trenches, forming beds and bunds, hoeing and irrigating the fields—all of which require strenuous physical labour. For operations like sowing, weeding, grinding, and transplanting etc., women labour are preferred because of lower wages. It is also striking to note that for crops grown on dry lands (rain-fed) or on wet lands (canal irrigated), more women are required than men. It is only on gardenlands with wells from which water is lifted by bullock power that more men are required than women. Child labour is needed for such operations as weeding, husking, spreading manures, watching of crops and carting. In certain parts of the Bhil tracts of Gujarat and the former Mewar State, even now the friends and relatives help each other on the fields. These get about $\frac{1}{2}$ lbs. of boiled maize every day at noon and take their morning and evening food at home.

Generally, the members of the families of the farmers supply most of agricultural labour needed on the fields. Labour is hired only occasionally during busy seasons and the percentage of such labour ranges from 10 to 20 per cent of the total labour required during the year. } The percentage of hired labour to the total farm requirement varied between 35.6 in West Bengal to 23.3 in Tamil Nadu. } Instances are common in which although hired labour may be necessary during certain important field operations poor farmers cannot employ outside labour for want of resources to pay wages with the result that crops suffer damage and the yield to the farmer from lands comparatively becomes low.

Supply of Agricultural Labour

Recruitment of labour in all agricultural operations and rural pursuits has a direct and complementary relationship with caste groups. In many cases not only does caste determine the nature of occupation, but different occupations give birth to various sub-castes hitherto unknown. The outstanding features of labour supply in agriculture are :—

1. Owner cultivators and high class tenants generally belong to high castes whose hereditary occupation has been cultivation, e.g., Brahmins, Rajputs, Thakurs, Kayasthas, Tagas, Syeds and Pathans.

2. Farm hands are recruited both from high and low castes. Usually they belong to the caste of the employer. The majority of this class considers agriculture as its principal, though not hereditary occupation, e.g., Kunbis, Vaishyas, Gujars, Ahirs, Jats, Sheikhs and Pathans.

3. Field workers are recruited mainly from lower castes which have agriculture as their subsidiary occupation, e.g., Julahas, Lodh, Chamars, Kumhars, Telies, Khatiks and Koris.

4. Landless floating hands are recruited from the lowest rung of the social ladder. They are recruited mainly from Doms, Dusadhs, Bhuiyas, Pahariyas, Dhimars, Ghatwara, Kols and Koris.

Unemployment and Underemployment of Agricultural Labour

Seasonal unemployment is a characteristic of agricultural industry and under employment of man power is inherent in a system of family farming. According to the first A. L. E., adult male agricultural labourers were employed on wages for 189 days in agricultural work and for 29 days in non-agricultural work i.e., 218 days in all. They were self-employed for 75 days. Casual male workers found employment for only 200 days, while attached workers were employed for 326 days in a year. Women workers were employed for 134 days in a year.

The second A.L.E. found that in 1956-57, agricultural labourers were employed for 222 days. Agricultural employment accounted for 194 days and non-agricultural employment for 28 days. Casual labourers were employed for 201 days and attached labourers for 271 days. Women workers were employed for 141 days.

According to the Rural Labour Enquiry, a male agricultural labour could on average get work for 272 days in 1964-65 as against 222 days in 1956-57. The corresponding figures for female workers were 183 days and 141 days.

Employment Pattern of Agricultural Labour Household¹

Category of workers	No. of days employed in					Total
	wage employments as			Uncla- sified	Em- ployment on Salary basis	
	Agricul- tural Labourer	Non-Agri- cultural Labourer	self- employ- ment			
1. Agricultural Labourer Household						
(i) Men	208	27	30	6	2	272
(ii) Women	138	15	28	2	—	182
(iii) Children	167	35	62	15	1	280

1. Rural Labour Enquiry, 1964-65 Summary Report.

2. All Rural Labour Household

(i) Men	183	52	31	9	2	277
(ii) Women	137	30	29	3	—	199
(ii) Children	156	31	64	14	2	267

The 19th Round of the N.S.S. found the incidence of unemployment among male workers as 2.68 per cent, for female workers it was 7.85 per cent.

Hours of work in agricultural have been found to be unduly long, particularly during the peak agricultural seasons. During harvesting and threshing, casual workers had to work for about 10 to 11 hours a day, with suitable rest interval; while during other periods they are comparatively short, subject to the availability of the sunlight. In fact, "there is no regularity in hours of work which depend on the goodwill and cooperation between the workers and employers and on local custom."

Income and Wages

The income of agricultural labourers is very low. A large part of their income is derived from wages. According to the second A.L.E. wages formed 73 per cent of their total income during 1956-57. They were paid partly in cash and partly in kind; about 49 per cent of the wages were paid in cash, 40 per cent in kind and 11 per cent in a mixed form. For 1950-51, these percentages were 57, 43 and nil.

The average daily earnings of agricultural labourer was 207 paise in 1950-51, 203 paise in 1956-57 and 297 paise in 1964-65. The daily wage for a male agricultural labourer was Rs. 1.09 in 1950-51, Re. 0.90 in 1956-57 and Re. 1.43 in 1964-65. For female workers the wage rate was Rs. 0.68 in 1950-51, Re. 0.59 in 1956-57 and Re. 0.95 in 1964-65. During this period of 14 years, there was some increase in the wage rate, but the real increase in wages was insignificant.

The average annual income per capita from all sources was Rs. 104 in 1950-51 and Rs. 99.4 in 1956-57. The income of agricultural labour household during this period fell from Rs. 447 to Rs. 437.5. But it rose to Rs. 660.2 by 1964-65.

Wide differences in the earnings of agricultural labourers have been found in states. In 1964-65, the total daily earnings of a male agricultural worker was highest at Rs. 5.19 in Kerala followed by Assam and Punjab at Rs. 4.80 and Rs. 4.20 respectively. Daily earnings in Maharashtra, West Bengal, Rajasthan and Gujarat were above the national average of Rs. 2.97 varying from Rs. 3.48 in Maharashtra and West Bengal to Rs. 3.10 in Gujarat. In the remaining States, the per capita daily earnings of agricultural labourers were below the national average, varying from Rs. 2.94 in Bihar to Rs. 2.39 in Madhya Pradesh and Rs. 1.93 in Jammu and Kashmir.

Average Daily Earnings of Agricultural Labour, During 1956-57 and 1964-65

States	Agricultural operations			Non-Agricultural operations			Daily Earnings		
	Men		Women	Men		Women	Men		Women
	1956-57	1964-65	1956-57	1964-65	1956-57	1964-65	1956-57	1964-65	1956-57
(1)									
1. Andhra Pradesh	0.87	1.21	0.55	0.85	0.97	1.29	0.67	0.74	1.22
2. Assam	1.54	2.21	1.15	1.70	1.68	2.59	1.01	1.70	2.16
3. Bihar	0.91	1.39	0.74	1.20	1.15	1.55	0.72	0.92	1.46
4. Gujarat	0.87*	1.47	0.55*	1.19	0.99*	1.63	0.68*	1.20	1.15*
5. Jammu & Kashmir	N.A.	1.93	N.A.	1.50	N.A.	...	N.A.	...	1.50
6. Kerala	1.28	2.11	0.70	1.23	1.36	3.08	0.58	1.10	2.33
7. Madhya Pradesh	0.76	1.11	0.59	0.86	0.90	1.28	0.57	0.60	1.16
8. Maharashtra	0.87*	1.47	0.55	0.77	0.99*	2.01	0.60*	0.38	1.86*
9. Karnatak	0.84	1.21	0.55	0.79	1.12	1.37	0.59	0.88	1.14
10. Orissa	0.80	1.33	0.55	0.89	0.90	1.52	0.57	0.63	1.12
11. Punjab *	1.98	2.13	1.22	1.45	1.38	2.07	0.40	0.97	1.62
12. Rajasthan	0.98	1.76	0.61	1.09	1.25	1.39	0.60	1.47	2.23
13. Tamil Nadu	0.84	1.39	0.48	0.85	0.91	1.53	0.48	1.18	1.75
14. Uttar Pradesh	0.92	1.10	0.65	0.93	0.99	1.47	0.59	0.80	1.91
15. West Bengal	1.43	1.81	0.98	1.36	1.27	1.67	9.90	0.98	2.70
All India	0.96	1.43	0.59	0.95	1.07	1.54	0.62	0.92	2.03
									2.97
									1.21
									1.87

*Figures relate to old composite (Bilingual) Bombay, Punjab State. N. A.

Although it is necessary to fix up minimum wages for agricultural labourers, yet due to a number of inherent weaknesses it could not be possible to effectively implement the provisions of the Minimum Wages Act, 1948 earlier than 1975. The difficulties related to :

- (a) low productivity in agriculture ;
- (b) low productivity per labour ;
- (c) small size of holdings which hindered the payment of required minimum ;
- (d) widely different conditions of employment ;
- (e) payment of customary wages ;
- (f) lack of organisation among the workers ;
- (g) excessive labour supply in some areas and lack of demand for it ; and
- (h) employment of family relations who need not be paid the wages.

Agricultural labourers are a class extremely poor. Their wages are much lower than the industrial labour. For example, in West Bengal an industrial labour gets about Rs. 268, while an agricultural labour only Rs. 160. The respective figures for Maharashtra are Rs. 463 and Rs. 88 ; for Bihar Rs. 332 and Rs. 119 respectively. The factors responsible for this disparity between the two groups are due to :

- (i) The absence of any regulation forbidding child labour. This is responsible for increased labour supply in agriculture and a lowering of wages.
- (ii) There is an excess of agricultural population in relation to the land available for cultivation.
- (iii) Often agricultural holdings are not large enough to allow large and modern production methods.
- (iv) Debt bondage has been the principal cause of low wages.
- (v) The unrecognised scattered nature of agricultural labourers and the seasonal character of agricultural operations reduce their bargaining capacity.
- (vi) The concentration of land in the hands of upper castes leads to social and economic exploitation of the weaker ones.
- (vii) They are usually untrained and often not properly organised. They have no trade unions to fight for their rights, for better wages and conditions of work.
- (viii) Small cultivators employ family labour, who would as far as possible, manage without hired labour except during seasonal exigencies.

Minimum wages have now been fixed in agriculture in practically all states; as would be clear from the following table. The Central Government has also fixed minimum wages in certain agricultural demonstration farms, research institutes and military farms under its control.

Statement showing State-wise wages in Agriculture¹

Name of the States 1	Date from which effective 2	Rates of wages 3
Central Government	18th September, 1976.	Rs. 4.45 to Rs. 6.50 according to areas.
Andhra Pradesh	2nd December, 1975.	Rs. 3.00 to Rs 5.00 per day according to areas.
Assam	October, 1974.	Rs. 5.00 to Rs. 6.00 per day or Rs. 4.50 to Rs. 5.50 per day with one meal, according to occupation.
Bihar	July, 1975.	Rs. 4.50 to Rs. 5.00 per day plus Nashita (in all districts except East & West Champaran) according to areas.
Gujarat	5th January, 1976.	Rs. 5.50 per day or Rs. 2,000 per annum.
Haryana	31st December, 1975.	Rs. 5.50 per day with meals or Rs. 7.00 per day without meals.
Himachal Pradesh	15th July, 1975.	Rs. 4.25 per day.
Jammu & Kashmir	No minimum wages have been fixed so far.	
Karnataka	2nd October 1975.	Rs.3.65 to Rs. 5.60 per day according to class of operation type of land.
Kerala	15th September, 1975.	Rs. 6.50 per day for light work and Rs. 8.00 per day for hard work.
Madhya Pradesh	2nd October, 1975.	Rs. 3.50 to Rs. 4.00 per day. according to zones.
Maharashtra	March, 1974.	Rs. 3.00 to 4.50 per day.
Manipur	—	Rs. 6.50 per day.
Meghalaya ^a	2nd September, 1975.	Rs. 4.50 per day with meal or Rs. 5.00 per day without meals.
Nagaland	Minimum Wages not fixed under the Minimum Wages Act.	
Orissa	1st January, 1976.	Rs. 4.00 per day.
Punjab	11th July, 1975.	Rs. 4.65 to Rs. 5.65 per day with meals or Rs. 6.70 to Rs 8.70 per day without meals.
Rajasthan	January 1975.	Rs. 4.25 to Rs. 5.00 according to areas.

1. *Report of the Ministry of Labour for 1977-78*, pp. 177-78.

1	2	3
Sikkim	Minimum Wages Act, not 1948 yet extended.	
Tamil Nadu	2nd March, 1976.	Rs. 3.50 to Rs. 5.00 per day (adult). Rs. 2.10 to 3.00 per day (Non-adults) according to type of operations.
Tripura	15 August, 1975.	Rs. 4.00 per day.
Uttar Pradesh	23 October, 1975.	Rs. 4.50 to Rs. 6.50 per day according to zones and type of work
West Bengal	1st October, 1975.	<i>Daily Rate</i> <i>Basic D. A. Total</i> Adult : 5.60, 2.50, 8.10 per day Child : 4.00, 1.82, 5.82 per day. <i>Monthly Rate</i> Adult : 80 60 65.10 145.70 Child : 39.00 47.25 86.25

Income and Expenditure Pattern

The average income for agricultural labour family was Rs. 437 and the average consumption expenditure was Rs. 617. The deficit was thus Rs. 180 as against Rs. 447, Rs. 468 and Rs. 21 in 1950.

During both the periods of enquiry, food group accounted for the largest share of total expenditure—the proportion being 85.3 and 77.3 ; the expenditure on fuel and lighting group was 1.1 and 7.9 ; that on clothing and footwear was 6.3 and 6.1 ; and miscellaneous services accounted for 7.3 and 8.7 per cent of the expenditure. Of the total expenditure on food about 80 per cent is that on cereals. Only 5 per cent of their food budget is accounted for by gur, sugar, vegetables, fish, meat and eggs.

The food taken by the labourers is far from satisfactory. Many do not get the required quantity nor get the requisite quality. It is said that if epidemics slay thousands every year malnutrition kills millions. Their diet usually consists of inferior cereals like jowar, bajri and millets with some pulses. Green vegetables are taken only on festive occasions. Ghee and milk are rarely included in the diet. They take their daily diet at about 12 a. m. in the noon and the meal in the evening after returning from the field. Often millet or barley bread and chillies and some salt are taken. The labourers as a class are more addicted to drink than others. They drink country liquor made of rotten barley and mahua seed. Whether the liquor injures health or not, addicts are economically at a low level. Whatever they earn they spend away, more at the *kalai's* shop than for the household. This results in deterioration in their financial status and their children and womenfolk suffer privation.

The Agricultural Labour Enquiry Committee attributed the poverty of the agricultural labour families to these causes :

(i) inability of the agricultural industry to provide adequate employment to agricultural families ;

(ii) lack of opportunities for self or non-agricultural employment ;

(iii) low wages paid for work done.

About 64 per cent. of agricultural labour families was indebted during 1956-57 as against 45 per cent in 1950. The average accumulated debt per household increased from Rs. 47 in 1950 to Rs. 88 in 1956. The average debt per indebted family rose from Rs. 105 in 1950 to Rs. 138 in 1956. This increase has been due to the higher proportion of attached labour households some of whom were under debt bondage and/or tie-in-allotment. The total estimated volume of indebtedness of agricultural family was Rs. 88 crores in 1950 and Rs. 143 crores in 1956.

Average amount of debt per household and average debt per indebted household (In Rupees)¹

Category of household	Average debt per indebted household contracted					Average debt per household
	Hereditary Loans	Cash	Loans in Kind	Cash & Kind	Total	
1. Agricultural Labour households	14.90 (6.1)	177.42 (72.8)	29.32 (12.0)	22.23 (9.1)	243.87 (100.0)	147.89
2. All Rural Labour Households	14.46 (5.8)	184.23 (73.5)	29.91 (11.9)	22.10 (8.8)	250.70 (100.0)	148.42

(Figures in brackets indicate percentage to total)

Of the total debt, about 64 per cent was incurred for meeting the consumption expenditure. Social purposes accounted for 24 per cent ; productive purposes, 19 percent and 11 per cent for miscellaneous items.

Of the total loan, 34 per cent was taken from money-lenders, 44 per cent from friends and relatives ; 15 per cent from employers, 5 per cent from shopkeepers and 1 per cent from co-operatives.

The most important feature is that the poverty stricken workers are not only under debt, but the burden of debt has been on the increase. This has adversely affected the economic living and social conditions of the agricultural labourers. In majority of cases, indebtedness has persisted for generations and along with it existed serfdom with incomes of less than Rs. 30 (at 1970-71

1. *Rural Labour Enquiry, 1964-65, Summary Report.*

prices) per month, majority live below the poverty line. Unemployment, underemployment, very low wages, combined with social oppression make the life of the agricultural worker miserable.”¹

State Policy Towards Agricultural Labour

The agricultural labourers, particularly the landless ones, belong to backward communities and they suffer from social disabilities and are prone to economic exploitation. Their living levels are low and their earnings are generally on the poverty line, uncertain and meagre for sustenance. Therefore, the *First Plan* observed, “Agricultural labour population are concentrated most in areas where population presses heavily on the land and the development in sectors of the economy other than the agricultural has been retarded. By selecting such areas for special programmes—such as C.D.P.—it should be possible to make a distinct contribution to the problem of rehabilitating agricultural labourers, for increase in the tempo of development is the effective answer to the problem of unemployment and underemployment.”

The First Five Year Plan suggested for :

- (i) fixation of minimum wages in low wage pockets and intensive development areas ;
- (ii) conferment of occupancy rights on the landless workers in regard to house sites ;
- (iii) organisation of labour co-operatives ; and
- (iv) the resettlement of the landless workers on newly reclaimed lands.

During the *First Plan* period, minimum wages for agricultural labourers were fixed throughout the Punjab, Orissa, Rajasthan, Coorg, Delhi, Himachal Pradesh, Tripura and Kutch. Provision of Rs. 1.5 crores was made for schemes for resettlement of landless labourers, and Rs. 32 crores were envisaged for the welfare of the backward classes.

The Second Five Year Plan was of the opinion that unless the agricultural labourers were properly rehabilitated in suitable occupations, the whole programme of accelerated economic growth would suffer. It, therefore, suggested substantial increase in agricultural production including animal husbandry ; increase in employment opportunities through extensive development of village and small industries, improvement in the social status, efficiency, initiative and ability of the agricultural labourers by means of redistribution of land and extension of educational facilities ; and improvement in the living conditions. Through these measures the plan emphasised for fuller employment and a larger measure of social justice for this class.

1. H. D. Malaviya, “Land Ceiling, Landless Labourers and Small Holders” *Mainstream*, June 7, 1975, p. 14.

In the *Second Plan*, a little less than Rs. 5 crores were spent on schemes for settlement of about 20,000 families of landless workers on 1 lakh acres of land. About Rs. 90 crores were spent on the welfare of the backward classes.

The *Third Five Year Plan* proposed to improve the conditions of this section of the population through extension in irrigation and soil conservation and village industries programmes. Rs. 7 crores were allotted for resettlement schemes of landless labourers. As a result of which about 7 lakh families were to be settled on 50 lakh acres of land.

The *Fourth Plan* stated : "In most part of the country the benefits of development have not reached the bulk of agricultural workers to any appreciable extent.....A large section of agricultural labour faces not only economic difficulties but also social disabilities. Adequate remedies for the present condition of agricultural labour lie on the one hand, in fundamental changes in the agrarian structure, including development of co-operative farming and land resettlement programmes, and on the other, in industrial and economic growth, and more especially the diffusion of industry into small towns and rural areas. It is hoped that the rural works programme will bring significant relief in a number of areas. The programme for provision of house sites for Harijans, agricultural workers and small peasants has to be implemented with a sense of urgency."

The *Fifth Plan* too has special programmes of helping agricultural labourers. As part of the "Special Programme of Rural Development", it envisages the uplift of the lowest 30 per cent of the rural population. Efforts are being made in three directions : (a) reorientation of the general programmes of agricultural development with a view to ensuring that the mass of Small and Marginal Farmers and Agricultural Labourers are increasingly enabled to benefit from these programmes which are to be developed, such as animal husbandry, fishery etc. Structure and policies of cooperative credit societies are also to be tilted in favour of these people ; (b) special assistance is to be given to the small farmers in the Area Development Programmes, particularly through the development of selected irrigation projects and development of special drought-prone areas ; and (c) intensification and enlargement of special programmes specially designed for the weaker sections like SFDA/MFAL.

Abolition of Bonded Labour

Following the recommendations of the Standing Committee on Agriculture and the deliberations of the Labour Ministers' Conference, 1975, the Bonded Labour System (Abolition) Ordinance, 1975 was replaced by the Bonded Labour System (Abolition) Act, 1976. The Act provides for the abolition of the bonded labour system and for the rehabilitation of the released bonded labour.

Under this Act, 102,060 labourers were identified, 100,962 freed, and 28,728 rehabilitated by the end of December, 1977.¹

This freed bonded labour is being rehabilitated by providing them with suitable employment, allotment of agricultural lands, house-sites, loans for purchase of milch cattle, sheep, carpentry implements, provision of education and free hostel facilities to the children of the freed bonded labour.

SPECIAL PROGRAMMES FOR AGRICULTURAL LABOURERS

India's rural working population consists mainly of small farmers and landless agricultural labourers. The N. S. S. in its 17th Round found that "during 1961-62, of about 49.8 million operational holdings in the country, a little over 40 per cent were less than one hectare in size and as many as 62 per cent were less than 2.02 hectares". Landless agricultural labourers constituted 25.8 per cent of the total rural working force in 1971. The problems of the small farmers and the agricultural labourers vary from area to area but the more common problems being fragmented and small holdings, insecurity of tenure, inadequate and untimely supply of agricultural inputs, lack of adequate credit facilities and marketing facilities—all of these have immensely hindered the development of agriculture on a sound basis and also stood in the way of improving the economic and social conditions of these people. Therefore, with a view to enable the weaker sections of the rural population to take advantage of the benefit of economic growth in the rural areas through spread of new technology, certain well-defined programmes were launched during the Fourth Plan period, particularly to increase employment opportunities and the productive potential of the economically weak farmers and landless agricultural labourers. Such programmes are :

1. Small Farmers' Development Agencies (SFDA) and Programmes for Marginal Farmers and Agricultural Labourers (MFAL);
2. Crash Scheme for Rural Development (CSRDP) ;
3. Integrated Land Redistribution and Drought Prone Area Programme (formerly known as Rural Works Programme) ; and
4. Tribal Area Development Agency.
5. Hill Area Development Projects.

1. *Report of the Ministry of Labour for 1977-78*, p. 23.

Small Farmers' Development Agencies and Marginal Farmers and Agricultural Labourers (SFDA & MFAL)

The All-India Rural Credit Review Committee, while considering the problem of small holdings, came to the conclusion that by proper state support and appropriate institutional changes, it would be possible to tackle effectively the problems of what it called "potentially viable farmers". These farmers were small farmers whose agricultural business could be rendered viable if there was support in terms of irrigation, supplies of inputs and services at fair prices, etc. It, therefore, recommended institutional set up in the form of Small Farmers Development Agency and suggested measures for expanding the flow of institutional credit and other state assistance to the small farmers in an integrated effect to raise their economy to surplus level.

Accordingly, the Planning Commission initiated during the Fourth Five Year Plan, two schemes in the nature of pilot projects in the Central Sector of the Plan. One was the scheme for Small Farmers' Development Agencies (SFDA) and the other for Marginal Farmers and Agricultural Labourers (MFAL). The SFDA projects were to be kept distinct from MFAL projects, because the accent on programmes in these two projects differed. But it was realised that their areas of operation might coincide in certain cases. Therefore, it was contemplated that it might be possible to use the SFDA as the instrument for executing the MFAL scheme.

During the Fourth Five Year Plan, 46 SFDA and 41 MFAL projects were initiated to improve the economic condition of the weaker section and generate better self employment opportunities. In the Fifth Year Plan (1978-83), all the SFDA/MFAL projects have been made composite and each agency required to assist small and marginal farmers and agricultural labourers in its area of operation. The number of projects has been increased from 87 to 160 in the Fifth Plan. Each new agency is expected to cover 50,000 beneficiaries, while agencies continuing from the Fourth Plan will extend coverage upto 30,000 beneficiaries during the extended period of three years i. e., 1976 to 1979. The outlay for each SFDA/MFAL project has been fixed at Rs. 1.5 crores for the project period.

For the purposes of these programmes, a small farmer is defined as one having a land holding of 2.5 to 5 acres and the marginal farmer below 2.5 acres of dry land. In the case of irrigated lands the limits of land holding are generally 50 per cent of those indicated above. The landless agricultural labour is taken as one who does not have any land holding but has a permanent homestead and deriving more than half of his income from agricultural pursuits.

The functions of the agencies are to identify the participants according to norms laid down by the Government of India, draw up suitable programmes for improved agriculture and subsidiary occupations, arrange credit through institutional source and get the programmes executed through the existing development and extension agencies in the project area

The agencies main thrust in the project area is on crop husbandry. Programmes of subsidiary occupations are also taken up depending upon the suitability of marketing facilities. The programme for improved agriculture includes land development, soil conservation, minor irrigation, horticulture, demonstrations, introduction of new and improved varieties, adoption of multiple cropping pattern etc. Considerable stress is laid on the adoption of dry land farming techniques and water harnessing measures in rain-fed areas. The subsidiary occupations include supply of milch animals, poultry, piggery, sheep and goat rearing and fisheries.

The identified small farmers are allowed subsidies upto 25 per cent and marginal farmers and agricultural labourers upto 33 1/3 per cent of the investment cost for various programmes. A ceiling of Rs 3,000 has been laid down for such subsidy from project funds to an individual participant during the entire project period. In case of group community projects like community irrigation works, subsidy upto 50 per cent is allowed from the project fund.

The total Fifth Plan provision for SFDA/MFAL has been laid at Rs. 174.50 crores. Till September, 1977, since the inception of the projects, the agencies had identified 130.56 lakh small farmers, marginal farmers and agricultural labourers. Of these, as many as 54.52 lakh have been enrolled as members of the co-operative societies. Under minor irrigation works, 5.29 lakh small/marginal farmers had been assisted to take up digging of wells, tubewells, pumpsets, etc. Another 9.67 farmers had been assisted under subsidiary occupations.

The Government of India has released grant in aid to the tune of Rs 134.31 crores to the projects since inception ; and out of this, Rs. 123.59 crores have been utilised.

The following table gives the progress of the SFDA/MFAL projects since inception.

1. *Report of the Ministry of Agricultural and Irrigation, Department of Rural Development, 1977-78, pp. 120-21.*

Cumulative Progress of Implementation of SFDA/MFAL Projects

	1970-71	1971-72	1972-73	1973-74	1974-75	1975-76	1976-77	1977-78 (Upto September)
(In Lakhs)								
1. No. of participants identified	4.06	22.30	34.93	39.27	46.03	84.59	122.36	130.56
2. No. enrolled as members of Coops.	0.37	7.25	14.95	19.33	23.28	34.78	50.77	54.52
3. No. of beneficiaries under								
(i) Minor Irrigation	0.04	0.31	1.60	1.73	2.21	3.38	4.76	5.29
(ii) Milch Cattle Programme	0.004	0.11	0.41	0.78	1.16	1.73	2.70	2.97
(iii) Poultry	Neg.	0.02	0.05	0.08	0.09	0.12	0.15	0.15
(vi) Other A.H. Programme	—	N.A.	N.A.	0.25	0.48	0.96	1.41	1.55
(v) Rural Artisan Programme	—	0.01	0.03	0.08	0.12	—	—	—
(vi) Rural Works Programme	—	0.03	1.09	2.25	2.83	—	—	—
4. Loans disbursed								
(a) Through co-operative								
(i) Short term	113.52*	1314.45*	2908.17*	2711.81*	2684.44	4231.89	6264.76	3084.08
(ii) Medium term	38.62	252.67	972.90	1617.51	2362.45	3469.08	5383.32	6034.07
(iii) Long term	83.11	783.60	2337.49	3517.56	4703.56	6112.31	8031.67	9117.96
(b) Through Commercial Banks								
(i) Short term	—	78.87	159.30	252.28	316.62	406.57	839.80	202.74
(ii) Term loan	—	43.79	433.53	1064.52	1678.21	2875.06	5045.93	5870.26
5. Amount released	406.91*	1276.88	3008.88	4683.88	6478.89	8128.89	11278.89	13431.27
6. Amount utilised	59.04	798.13	2375.97	4152.56	5723.55	8392.70	11969.79	12359.15

* Includes Rs. 6.91 lakhs released in 1969-70.

* Relates to Co-operative year.

Figures for short term loans both through Co-operatives and Commercial Banks are for concerned year only.

The following observations would point out the results of these projects :

"We have sufficient evidence to prove that proper attention has not been given to the problem of identification of small farmers. It is our impression that SFDA programme is treated as a programme of extended benefits and farmers try to make suitable adjustments to pocket these benefits....The result is that all the benefits extended under the scheme have not gone to the small farmers and leakages in the real effectiveness of the programme have been found to be not less than 30 p.c."¹

Another study, conducted in MFAL districts, has indicated that while the programme was intended to be limited to only marginal farmers, out of 48 participant households selected for the study 6 have lands between 28 and 4 hectares. These features are disturbing. If the programme for small and marginal farmers has to be truly a programme for removal of their poverty, it is necessary to be vigilant and selective and to direct state assistance to those who deserve it the most. The dilution of the programme through leakages cannot be allowed.²

In view of these findings the National Commission on Labour has suggested that (i) for the purpose of the programme the maximum limit of holdings of small farmers should not be above 2 hectares and of marginal farmers above one hectare. (ii) The coverage of small and marginal farmers in the combined project areas should preferably be in the ratio of 1:3 on an average (as against 3:1 at present) to ensure that the programme has the necessary tilt in favour of marginal farmers. (iii) 70,000 farmers (17,500 small and 52,500 marginal) should be covered in an area under an agency, and there should be one agency for one district. (iv) The programme should be extended during the Five Year Plan to 160 units covering 11 million families. (v) It would be appropriate and reasonable to distribute the additional agency units on the basis of the state-wise distribution of the number of small and marginal farmers and agricultural labourers. (vi) In extending the programme, emphasis should be on the selection of areas having fairly assured rainfall. The programme need not be extended to drought affected areas in which a separate programme has been taken up. (vii) Individual subsidiary programmes such as milk production, poultry raising, sheep rearing and pig production should be superimposed as separate programmes in these combined programmes, district which coincide with those for the special subsidiary programmes. (viii) The combined programme agencies should be in close touch with the

1. Agricultural Economics Research Centre, *Small Farmers Development in Anrītsar—Ferozpur—An Evolution of Progress and Problems*, Delhi, 1973.
2. Agro-Economic Research Centre, *Study on Marginal Farmers and Agricultural Labour Development Programme in the district of Bankura West Bengal, Vishwa Bharti, Shantiniketan*, 1973.

special subsidiary programmes and be responsible for identifying the beneficiaries amongst the small and marginal farmer and agricultural labourers for these programmes. (ix) The entire programme should be time bound and target oriented and should be implemented with a sense of urgency. (x) The extension machinery in the districts should be strengthened and oriented to pay particular attention to the problems of small and marginal farmers. (xi) As many farmers' Service Societies as possible should be established in the project areas to ensure the provision of credit, service, supply and marketing facilities and also technical advice at one place.¹

Crash Scheme for Rural Development

The crash scheme for Rural Development (CSR D) was sponsored by the Central Government and implemented through the agency of State Governments, in April 1971 for a period of three years.

The primary objectives of the Scheme were :

(i) the direct generation of employment for 1000 persons, on an average, continuously over a working season of 10 months in a year in all rural districts of the country through the execution of projects which are essentially labour intensive.

(ii) the production of assets or works of a durable nature in consonance with local development plans so that alround development of the districts is assisted.

The labour intensive works to be largely taken up under this scheme related to land development and reclamation, road building, drainage, minor irrigation, water conservation and ground water recharging, soil conservation, afforestation and special repairs.

For implementation of these objectives, special directions were issued to the State Governments for selections of the projects workers and allocation of funds, viz.,

(a) Only those projects which were prepared in conformity with the plans of local development and which were expected to yield certain tangible results over a period, were to be selected in each district.

(b) The work force had to be selected keeping in view the fact that job opportunities should be offered firstly to those workers in rural areas who were totally unemployed, than to those households where no adult person was in employment and then to partially employed workers.

(c) The pattern of allocation of funds was to be 45.55 per cent for labour, 49.45 per cent for material and 5.00 per cent for the field staff.

1. National Commission on Labour, *Interim Report on Reorientation of Programme of Small Farmers and Marginal Farmeres and Agricultural Labourers Development Agencies*, 1973, pp. 2-4.

Initially Rs. 50 crores were allocated in 1971-72 but in 1972-73, Rs. 48.4 crores and in 1973-74 Rs. 47.5 crores were provided. This reduction was due to the taking up of a special project entitled "Pilot Intensive Rural Employment Project." (PIREP) with an allocation of Rs. 1.5 crores for 1972-73 and Rs. 2.5 crores for 1973-74.

During the three years, 1971-74, total cost of various schemes totalled Rs. 156.6 crores of which about 79 per cent was on construction of roads and 10 per cent on minor irrigation works.

As against the minimum and maximum targets of 525 lakh man-days and 875 lakh man-days, respectively, for generating rural employment under scheme, the physical achievements were 790 lakh man-days in 1971-72, 1338 lakh man-days in 1972-73 and 627 lakh man-days in 1973-74.¹

The evaluation for the working of the scheme brings out the following conclusions :

(i) The daily wage rates in these projects were perceptibly lower than the normal wage rates.

(ii) The coverage of working force was uneven and disproportionate with reference to proportionate labour force in the states.

(iii) The projects did not bring out diversification or transformation of rural labour towards other sectors of the economy.

(iv) The projects were mostly of absorptive nature i. e., they could not create perennial potentialities of employment for as soon as they were completed they threw the workers out of employment.

(v) The project did not lay the foundations for the industrialisation of the rural economy, which is imperative for creating continuous job opportunities.

4. Integrated Land Distribution & Drought Prone Area Programme

An integrated land distribution programme was chalked out and implemented by the Planning Commission during the Third and subsequent Plans. The object has been to remove the disabilities of small farmers and the poverty of the landless agricultural labour through redistributing the land, available from reclamations and acquisition as surplus land over the ceiling on the holding of land. The scheme tried to modify the strategy of rural development "to improve the absorptive capacities and productive capabilities of millions of small farmers". For distribution of land the policy adopted is : (a) No household ownership holding will be larger than 8 hectares or it may be 6 hectares in wet lands and 10 hectares in dry lands, (b) Non-land owning and non-cultivating households will not be given agricultural land released for redistribution. (c)

1. R. B. I., *Report on Currency & Finance*, 1973-74, p. 23.

The land released through fixing a ceiling on holdings is to be distributed among households which have less than 2 hectares.

With such a land distribution policy, it was envisaged that the difference in per capita land ownership between the smallest and the largest household holdings may not be more than five times. Besides the proportion of people below the poverty line would be reduced from two-fifths to about one-third.

In almost all States, rules have been framed to give priority to landless labourers particularly to those belonging to the Scheduled Castes and Scheduled Tribes in the allotment of Government and fallow lands. In addition to this, lakhs of hectares were distributed among landless labourers out of the land that became surplus as a result of the implementation of ceiling laws. The Draught Prone Area Programme has already been discussed in an earlier chapter.

Trial Area Development Project

This programme was launched during 1971-72 for the development of six selected tribal areas in Andhra Pradesh (Srikakulam), Bihar (Singhbhum), M. P. (Dantewada, Korta) Orissa (Ganjam, Koraput). Under this programme, special Tribal Development Agencies (TDA) study the problems of tribal areas relating to the economic development, communication and administration, agriculture and allied activities. The programme will continue till 1978-79.

Two more projects (Keonjhar and Phulbani) in Orissa were taken up as part of the Fifth Plan. Rs. 12 crores has been provided for these 8 TDA projects. By 1977-78, the total expenditure was of the order of Rs. 12.03 crores since inception. The projects utilized Rs 10.41 crores till this period.

These projects have so far identified about 353,384 tribal participants, of which 293,012 have benefitted under the different economic development programmes. About 5.8 lakh hectares land has been brought under improved agricultural practices for cultivation of various crops. About 18,626 acres have been reclaimed/developed and given for the settlement of landless tribal families. Construction of about 4,000 dugwells, 80 minor works, 423 Km. of link roads and about 425 arterial roads have been completed.¹

Hill Area Development Projects

Some pioneering projects, for the all round development of agriculture and improvement in the living conditions of the farmers in the hilly areas, were taken up in H. P. (Mandi and Kangra districts), Tamil Nadu (Nilgiri district) and U. P. (Almora district) under the Indo-German Assistance Programme Based on the encouraging results, two more projects in Manipur and U. P. were taken up during the Fourth Plan, financed entirely out of domestic-

1. *Report of the Department of Rural Development for 1977-78*, p. 44.

resources. Another project has been taken up in U. P. All these projects will continue till 1978-79 with an outlay of Rs. 2.70 crores.

ABOLITION OF BONDED LABOUR

Ever since Independence, there has been no difference of opinion on the need to abolish the system. Article 23 (1), forming part of the chapter on Fundamental Rights in the Constitution, lays down : "Traffic in human beings and begar and other similar forms of forced labour are prohibited and any contravention of this provision shall be an offence punishable in accordance with law." Convention 29 of the International Labour Organisation (ILO), to which India is a party, said that "forced or compulsory labour" could not be permissible. Section 374 of the Indian Penal Code has declared any form of forced labour as an offence. In 1961, the Dhebar Commission emphasised that a special legislation should be adopted to abolish bonded labour, to which repeated attention had been drawn by the Commissioner for Scheduled Castes and Scheduled Tribes.

The practice was formally abolished on Oct 25 1975 when a notification was issued for the purpose by the Union Government saying that "No person shall make any advance under the system or compel any person or render any bonded labour or other form of forced labour. Any custom or tradition or any contract by any member of the family or dependent of such person, who is required to do any work or render any services as bonded labour shall be void and inoperative. No person, who has been freed and discharged under this ordinance, shall be evicted from any homestead or other residential premises which he has been occupying.

All property vested in a bonded labourer under any mortgage, charge, lien or other incumbrances in connection with any bonded debt stand freed and be restored to the possession of the bonded labourer. If any delay is made in restoring any property, such labourer is entitled to recover from the mortgagee, charge or incumbrance as may be determined by the civil court."

Liability to repay bonded debt, according to the Ordinance, stands extinguished. Every obligation of a bonded labourer to repay any bonded debt, or such part of any bonded debt as remains unsatisfied immediately shall be deemed to have been extinguished. No suit or other proceeding shall lie in any civil court or before any other authority for recovery of any bonded debt or any part thereof.

No creditor shall accept any payment against any bonded debt, which has been extinguished or deemed to have been extinguished or fully satisfied.

Any violation of the provisions of the Ordinance shall be a cognizable and bailable offence, punishable with imprisonment which may extend to three years or fine upto Rs. 2,000, or both.

Consequent to the declaration of the ordinance, Andhra Pradesh, Kerala, Orissa, U. P., Bihar, Maharashtra, Karnataka, Rajasthan, Gujarat, M.P., and Tamil Nadu had abolished bonded labour.

SUGGESTIONS FOR IMPROVEMENT OF LANDLESS LABOUR

We give below a few suggestions to improve the lot of the landless workers. These relate to : (i) Regulation of hours of work ; (ii) Improvement in the conditions of work ; (iii) Protection of child and female workers ; (iv) provision of education and amenities ; and (v) Provision of social security benefits.

(i) **Regulation of Hours of Work.** The workers have to work for very long hours. These need be regulated. The working hours in no case should exceed 12 hours for males and 10 hours for females and 56 hours in a week. Extra payment should be made if the work exceeds 8 hours. *Secondly*, the fixation of working hours should apply to all agricultural workers. *Thirdly*, there should be a break of at least 1 hour between the morning and afternoon working hours during winter and rainy days and at least 2 hours during summer. The duration of working hours may be 10 during summer, 11 during monsoon and 9 during the winter months. *Fourthly*, no overtime work should be allowed. *Fifthly*, night work in case of children and women and in winter and monsoon months should be entirely prohibited.

(ii) **Improvement in Conditions of Work.** Sweating with its triple evil of long hours of work, insanitary conditions and low wages is common in agriculture. The agricultural labourers are required to work in dirty mud and water during the rainy season, in the scorching heat of the summer and in the early and late hours of winter. These conditions make them an easy prey to itches, ringworm, skin diseases, besides cold and sun-stroke. Therefore, working conditions need be improved, *Firstly*, only male adults may be allowed to work during rainy season, when liability to disease is high and conditions of work difficult. *Secondly*, women and children should be prohibited from heavy work under unhealthy conditions. *Thirdly*, women with five or more months' pregnancy should stop all manual work. *Fourthly*, the nature and amount of work and the conditions under which it is done should be under the special care of the Labour Officer.

(iii) **Protection of Women and Child Labourers.** Measures should be taken to ensure to woman earners employed in agricultural undertakings protection before and after child-birth similar to that provided by the International Draft Convention adopted by the International Labour Conference at Washington for women employed in industry and commerce, and that such measures should include the right to a period of absence, from work before and after child-birth, and to a grant of benefit during the said periods, provided either out

of public funds or by means of a system of insurance. The work should be stopped two months before and at least one month after child-birth. Further, they should be allowed half an hour twice a day for the purpose of nursing the child.

So far as child labour is concerned, it may be said that employment of children during school hours should be definitely forbidden, and their attendance at school made compulsory. Child labour should be prohibited from employment requiring hard manual labour. If at all they are engaged, a day's holiday should be provided for them.

(iv) **Provision of Social Amenities.** In order to improve the efficiency and standard of living, it is essential that proper arrangements are made for organising vocational, technical and elementary education. Recreation facilities like that of *natak mandis*, *akharas*, *melas*, *kirtans* and radio programmes must be provided.

(iv) **Provision of Social Security Benefits.** The five giants viz., *Want*, *Disease*, *Ignorance*, *Squalor* and *Idleness* hold under their grip the lives of these people. A simultaneous attack, therefore, needs be launched. *Constructive community services*, *subsidised consumption services* and *social security measures* need be undertaken.

(vi) **Improvements in Agricultural Sector.** Low wages in agricultural employment are associated with the low productivity of Indian agriculture as well as the low productivity of agricultural labour which is mostly unskilled labour. The solution of the former problem requires far-reaching improvements in agricultural sector e. g., intensive rural development projects so that the sector can generate more income by increasing the productivity of workers, projects for soil conservation works, better farming methods and training of the farmer in modern agricultural skill, increase of rural credit facilities etc. Plans for promotion of small-scale industries in village, road construction, improvement of facilities and public utilities for infrastructure development need be pursued. Development of the countryside and of industries in villages as well as the dispersal of industries from crowded industrial towns towards the countryside would be helpful.

There is also need for training programmes for villages and creation of jobs in the rural areas that call for more skilled labour so that the trained persons would be better able to find, if necessary, an independent market for their labour outside the particular rural works in which they have been absorbed.

In the end, it is worthwhile to note the observation made by the Estimates Committee (1965-66), which reported that neither agriculture nor large scale industry or even both of them together can absorb the growing number of unemployed and under-employed in the villages and that "Only a well thought-out and comprehensive programme of decentralised industry in the rural areas, implemented with drive, sincerity and a sense of urgency can provide an answer to the vast problem of rural unemployment."

Appendix 1
Total Workers and Agricultural Workers 1971

State	Total Population	% of Rural Pop.	Total Workers (millions)	Agricultural Workers		Percentage of Agr. Labourers to Total Workers	
				As Cultivator (m)	As Ag. Labourers (m)	Total (m)	
Andhra Pradesh	43.4	80.7	18.0	5.8	6.8	12.6	70.1
Assam	15.0	91.6	4.2	2.4	0.4	2.8	66.4
Bihar	56.3	90.0	17.5	7.6	6.8	14.4	82.3
Gujarat	26.7	71.9	8.4	3.6	1.9	5.5	65.6
Haryana	10.0	82.2	2.7	1.3	0.4	1.7	65.3
H. P.	3.4	92.9	1.3	0.9	0.05	1.0	74.8
J. & K.	4.6	81.7	1.4	0.9	0.04	0.9	87.8
Kerala	12.3	83.7	6.2	1.1	1.9	3.0	48.5
M. P.	41.7	83.7	15.2	8.1	4.1	12.2	79.4
Maharashtra	50.3	68.8	18.4	6.5	5.4	11.9	64.9
Karnataka	29.3	75.7	10.2	4.1	2.7	6.8	66.7
Nagaland	0.5	90.1	0.3	0.2	0.004	0.2	79.0
Orissa	21.9	91.7	6.8	3.4	1.9	5.3	77.4
Punjab	13.5	76.7	3.9	1.7	0.8	2.5	62.7
Rajasthan	25.7	82.4	8.0	5.2	0.7	5.9	74.2
Tamil Nadu	41.1	69.7	14.7	4.6	4.4	11.0	61.7
U P	18.4	86.0	27.3	15.7	5.4	21.1	77.7
West Bengal	44.4	75.4	12.4	4.0	3.3	7.7	58.4
All-India	574.4	80.1	180.5	78.3	47.5	125.8	69.7

1. (Indian Agriculture in Brief, 1977, p 16).

Appendix 2
Daily Agricultural Wages for Different Operations in Some States

State/District	Village	Month & year	Normal daily working hours	Field labour			Other agricultural labour			Herdsman			Skilled labour (In rupees)		
				Man	Wo- man	Child	Man	Wo- man	Child	Man	Wo- man	Child	Car- pen- ter	Black- smith	Cob- bler
1	2	3	4	5	6	7	8								
Andhra Pradesh															
Krishna	Ghantasala	Nov., 77	8	5.00	4.00	—	5.00	4.00	—	4.00	3.00	—	7.00	8.00	5.00
Guntur	Tadikonda	Nov., 77	8	4.00	3.00	3.00	4.00	3.00	3.00	4.00	3.00	3.00	8.00	7.00	5.00
Hyderabad	Arutala	Nov., 77	8	4.00	3.00	2.00	5.00	3.00	2.00	4.00	—	1.25	9.00	8.00	—
Assam															
Golaghat	Sokial	March, 78		Not Reported											
		April, 78	8	6.00	6.00	5.50	5.00	5.00	4.00	5.00	—	4.00	15.00	—	—
Gujarat															
Kaira	Pellad	Aug., 77	8	5.50	5.50	5.50	—	—	—	—	—	—	15.00	—	—
Panchmahals	Dohad	Aug., 77	8	5.50	5.50	3.00	5.50	5.50	3.00	2.50	—	—	12.00	10.00	7.0
Himachal Pradesh															
Chamba	Chowari	Jan., 78	8	5.25	5.00	4.50	5.25	5.00	4.50	—	—	—	13.00	7.00	14.00
Karnataka															
Bangalore	Harisandera	Feb., 78		Not Reported											
Tumkur	Geddehalli	Feb., 78	8	5.00	4.00	2.50	4.00	3.50	2.50	3.50	3.25	2.50	10.00	—	—

1	2	3	4	5	6	7	8					
<i>Maharashtra</i>												
Amrawati	Khalapur	July, 77	8	3.50	2.50	1.25	3.00	2.00	1.00	10.00	10.00	5.00
		Aug., 77 to										
		Dec., 77										
Akola	Akoli	July, 77 to										
		Dec., 77										
<i>Orissa</i>												
Balasore	Soro	Dec., 77	8	4.00	3.00	3.00	4.00	3.00	3.00	7.00	8.00	—
Ganjam	Aska	Dec., 77	8	4.00	4.00	3.50	4.00	4.00	3.50	3.00	7.00	6.00
<i>ripura</i>												
Govt. Agril.	Farm	Feb., 77	8	4.00	4.00	1.50	4.00	4.00	1.50	—	—	—

Appendix 3

Daily Agricultural Wages in Certain States—Operation-wise

State/District	Village	Month & year	Type of labour	Nor- mal daily work- ing hrs.	Sow- ing	Weed- ing	Har- vesting	Other agri- cul- tural labour	Herds- man	(In rupees)		
										Car- penter	Black Smith	Cob- bler
<i>Bihar</i>												
Patna	Mahadevpur	March, 78	M	8	—	—	8.50	7.00	—	10.50	10.50	—
Muzaffar- pur	Narsinghpur	March, 78	M	8	4.75	4.75	—	—	—	10.00	10.00	—
Ranchi	Gaitalsood	March, 78										
<i>Uttar Pradesh</i>												
Karnal	Uggarkheri	Nov., 77	M	8	10.00	10.00	—	8.00	—	16.00	—	—

<i>Madhya Pradesh</i>									
Hoshanga- bad	Sangakhe- rakalan	March, 78	M	8	—	—	7.00	—	—
				8	3.50	3.50	—	3.50	—
			W	8	—	3.50	—	3.50	—
			C	8	—	2.45	—	2.45	—
Sarguja	Basdei	March, 78	M	8	3.50	3.50	—	3.50	4.00
			W	8	—	3.50	—	3.50	—
			C	8	—	2.45	—	2.45	—
Morena	Bijaipur	March, 78	M	8	6.00	10.00	—	10.00	10.00
			W	8	—	5.00	—	6.00	—
			C	8	—	5.00	—	4.50	—
Satna	Kotar	March, 78	M	8	—	3.50	—	4.00	8.00
			W	8	—	3.50	—	3.50	—
			C	8	—	—	—	2.75	—
<i>Kerala</i>									
Kozhikode	Koduvally	Nov., 78	M	4—8	8.00	8.00	—	9.00	12.00
			W	8	—	—	7.00	7.00	—
Palghat	Elapully	Nov., 77	M	4—8	6.00	6.00	—	5.00	12.00
			W	8	—	—	5.00	4.00	—
<i>Punjab</i>									
Ludhiana	Pakhawal	Feb., 78	M	8	10.00	—	—	10.00	23.00
<i>Rajasthan</i>									
Ganga- nagar	Dulmana	March, 78	M	8	11.00	11.00	11.00	—	—
			W	8	—	—	9.00	—	—
			C	8	—	—	8.00	—	—
Kotah	Dhoti	March, 78	M	8	—	—	—	5.00	—
			W	8	—	—	—	5.00	—
			C	8	—	—	—	3.75	—

Rural Credit & Rural Indebtedness

RURAL CREDIT

Introduction

Like all other producers, the farmers also require credit. "Credit supports the farmer as the hangman's rope supports the hanged." That agriculturist cannot carry on his business without outside finance is a fact proved by history and evidenced by the poverty and indebtedness of the persons engaged in the business of agriculture. Agricultural credit is a problem when it cannot be obtained and it is also a problem when it can be obtained, but in such a form that, on the whole, it does more harm than good. In India it is this two-fold problem of inadequacy and unsuitability that is being continually faced by the farmers.

Characteristics of Agriculture and Industry

The study of agricultural credit needs a special treatment because of the fact that agricultural production and organisation possess fundamental differences from that of the industry or other economic activity. These characteristics are :

1. **Agriculture is a complex of many industries**, i.e., it is not a single homogeneous industry but an industrial complex of many different types of production and marketing. For instance, farms vary in size from the large bonanza estates in the U. S. A. or collective farms in U. S. S. R. or cooperative farms in Israel, covering hundreds of hectares, to the unpretentious small holdings peculiar to India. Agricultural methods also vary, dependent largely upon tradition, general economic needs and local conditions. The size of the holding, forms of land tenure and methods of production differ from place to place, and create many different kinds of complex relationships between farmers on the one hand, and the middlemen, manufacturers and consumers on the other. The peculiar problems of marketing (like heavy sales in villages, adulteration and lack of means of transport) and finance (i.e., its costliness and inadequacy) are also influenced and controlled by the mode of agricultural organisation. It is this complex nature of agriculture that makes the financing of agriculture relatively more difficult than the financing of industry and trade.

2. **The small size of the farm.** The size of farms is very small as compared to the representative factory, from the point of view of

the amount of labour employed, the extent of capital invested and the value of the annual turnover. Further, there is no control over the yield and quality, and there is a lack of security to be offered for loans. As such, credit agencies like the commercial banks, naturally prefer lending to a few big manufacturers in cities, whose credit can be more easily assessed, to lending to a number of small scattered farmers. The fact that he is a small-scale producer reduces the bargaining power and credit-worthiness of the farmer, and makes it difficult for him to secure adequate supplies of credit and reasonable rates of interest.

3. Difficulties of Combination in Agriculture. The farmers are further handicapped from getting cheap credit because they are mostly individualistic and suspicious of combining with each other. Combinations to secure a common purpose are more numerous in industry but rather rare in agriculture. Belshaw has rightly said, "the nature of the farm economy develops social characteristics and habits of mind that raise a barrier to corporate effort." Therefore, even when combinations are known to be beneficial, as in the marketing of agricultural produce and the obtaining of cheap credit, they have even now not become common in agriculture. This has retarded the availability of cheap finance.

4 Risks in Agriculture. In agriculture it is difficult to foresee risks and provide against uncertainties. The farmer has to face a large number of uncertainties and risks like those of droughts, floods, accidental breakdown of farm machinery, unsuspected defects in seed and manures, infectious plant diseases and destructive pests may cause unexpected but considerable damage to the farmer. Hence, a predetermined output cannot be had by regulating the intensity of his effort. Further, agricultural produce tends to deteriorate in storage and the lack of proper storage facilities to hold back surpluses, when supply exceeds demand; lead to further difficulties. These add to commercial risks of agriculture, which arise out of the operations of natural hazards, the nature of the agricultural operations and the uncertainty of agricultural production. The frequent changes in weather makes it difficult for the farmer to adjust his output to fluctuations in demand. This fact further aggravates the situation for a large proportion of agricultural capital like land is so highly specialised that it cannot be easily diverted from one use to another, and even the farmer cannot afford to change from one crop to another due to numerous unfavourable factors such as the weather, the differences in fertility of the soil, and the changing demand in the market, and the lack of proper marketing facilities. He, therefore, cannot easily regulate his supply in accordance with variations in demand. The farmer must, therefore, carry the entire risks of his productive operation himself, for unlike industry, he cannot transfer a part of his prospective profits by inducing his lenders to share his risks.

5. The long economic lag in agriculture. There is a long interval in agriculture during which costs are incurred before a crop is harvested and put into the market. It takes months to receive the return of its labour and supply of agricultural produce is seasonal while the demand exists all the year round. This makes financial arrangements much more unavoidable in order to make adjustments of both and stabilize prices. Further, the farmer can hardly foresee the conditions which may prevail at the time the crop will be marketed and even if the conditions can be foreseen there is always the possibility that the farmers' judgment might be mistaken.

6. Other features. The farmer also suffers from ignorance and poverty and is heavily indebted to the village mahajans. His need for ready money to pay off land revenue and family burdens often compels him to dispose of his crops at the wrong time, wrong place and at the wrong price. *Secondly*, the markets are usually located at some distances from the farm; devoid of suitable road links. The demand ordinarily fluctuates, and produce is either perishable or cannot be stored for a variety of reasons—all these factors also increase the commercial risks peculiar to agriculture.

The farmer is unable to control successfully either his output or his income. This uncertainty regarding the yield from land and the income from the sale of produce, makes the ordinary credit agencies unwilling to lend to farmers except at higher rates than those charged to other industries; and thus agricultural credit is not easily available as and when needed.

The Committee on Agricultural Credit in England has very succinctly placed the entire situation thus :

"In the very nature of things the agriculturist is often isolated and remote from the normal opportunities for obtaining credit. Compared with those of the manufacturer and the trader his operations are complex, long in their cycle and subject to exceptional risks from weather and disease beyond the ordinary ups and downs of prices and wages which he suffers in common with industrialists. For greater part of the year, and specially when he is most in need of credit, his credit is sunk in the form of wealth, difficult for any one but an expert to value and not readily chargeable as security for an advance, while his personal training and method of life are not such as to fit him to surmount these disadvantages and to establish that position in the credit market to which his financial stability and high standard of probity generally entitle him." These observations apply to India *in toto*.

The Need for Credit in Agriculture

The demand for capital in agriculture is a composite demand made up of demands for different types of capital goods which vary

greatly in the degree of their fixity or permanence. Agriculture requires the following capital goods :

- (i) Land and its improvement ;
- (ii) Agricultural implements, machines and livestock ;
- (iii) Requisite inputs such as seed, irrigation, fertilisers, oil, cement etc. ;
- (iv) Stocks of food and clothing to maintain the farmer and his family during the period of production.

In other words, capital/credit in agriculture is needed both for productive and non-productive business needs of cultivators. According to the *Rural Credit Survey Committee* (1959), the productive purposes accounted for 43.7 p.c. and non-productive purposes for 56.3 p.c. of the total borrowings in the case of rural families; and 46.6 p.c. and 53.4 p.c. in the case of cultivators; and 25.9 p.c. and 74.1 p.c. in the case of non-cultivators. In the case of cultivators, about 32.0 p.c. of the borrowing was for capital expenditure on farm, about 13.0 p.c. for current expenditure on farm and about 47.0 p.c. for family expenditure and the rest for non-farm expenditure.

In other words, about half of the borrowed funds were utilised for unproductive family expenditure and a little less than one-third was spent on farm improvement. As between the cultivators and non-cultivators, the emphasis on the purposes varied as will be clear from the following table :

Purpose of borrowing¹

Purpose of borrowing	Borrowing for the purpose as percentage of the total borrowings		
	All India	Cultivators	Non-Cultivators
1. Capital expenditure on farm	27.8	31.2	6.2
2. Current expenditure on farm	9.3	10.6	1.1
3. Non-farm business expenditure	6.6	2.5	18.5
4. Family expenditure	50.2	46.9	69.9
5. Other expenditure	5.7	6.0	4.4
6. More than one purpose	0.4	0.5	0.1
Total	100.0	100.0	100.0

1. *Rural Credit Survey Committee Report, 1959.*

The need to satisfy for which credit is required could be related either to :

(a) *Conduct productive activity at normal levels of efficiency*, which means obtaining credit directly for annual production needs such as purchase of seeds, manures, fertilizers, agricultural implements, livestock and for payment of rent, revenue, wages, and for current expenditure incurred on the maintenance of the farmer and his family. Such credit is generally called *Production and Equipment Credit*. This type of credit is needed to start and carry on the work of production efficiently.

(b) *Develop or conserve resources*, which requires credit for developing fully the potentialities of the resources of cultivators which are left unutilised in the course of his current productive activity. Farmers require credit not only to pay off their previous debts; and redeem their mortgaged land but also for draining and fencing of the land, construction of wells or digging of tanks and making of embankments, construction of farm buildings or for tree or orchard planting. The credit for these purposes adds to the income of the farmer by enabling him to undertake improvements. This type of credit can be called *Settlement and Development Credit*.

(c) *Meet circumstances of calamity or distress*, occasioned by the incidence of famine, flood, or locusts or any other calamity. The requirements of such finance is above all the requirements for ordinary production needs and consumption needs.

Thus, credit may be obtained either for *production or consumption*. *Productive credit*¹ "is that credit which is employed to stop a loss, or effect economy or to create something materially tangible. The savings or gains which result ought eventually be equal to the sum borrowed, hence, no one need be afraid of this form of credit provided the amount and the extent be judiciously limited to availability of prompt payment." As has been rightly said, "productive credit makes its own security and liquidates itself."

On the other hand, *consumption credit* is "the straw that breaks the camel's back." According to Prof. T. N. Carver, "It is undoubtedly a bad practice to borrow money with which to buy articles of consumption...and give a farm mortgage as security because it encourages over-borrowing and it may be more costly to the borrower."¹

It may be noted that no hard and fast line can be drawn between business and consumption credit. Profs. J. W. Duggan and R. V. Battles have observed; "Even the purpose of the loan does not represent as to whether it is business or consumption credit. It is easier to distinguish a purpose if a complete financial record of

1. Carver, T. N., *Rural Economics*.

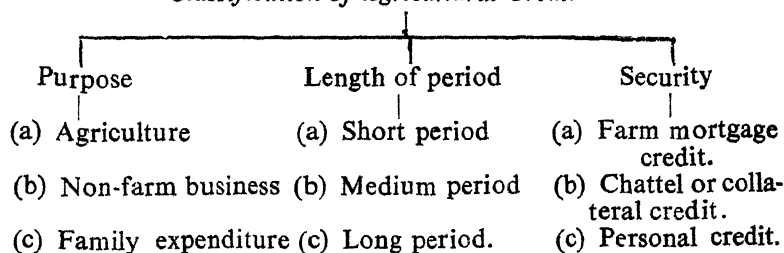
the farmer is available but even there may be some difficulty in affixing an appropriate label to some loans."¹ Very often one type of credit shades into other.

According to the All India Rural Credit Survey Committee, 28 p.c. of the credit is taken for productive purposes, 50 p.c. for non-productive, and 32 p.c. for unproductive purposes.

Classification of Agricultural Credit

Agricultural credit may be classified on the basis of (a) the purpose for which it is needed; (b) the length of the period for which loans are required; and (c) the security against which loans are advanced.

Classification of Agricultural Credit



(A) According to Purpose

Following the Reserve Bank's classification of agricultural credit by purpose, we may say that such credit is required to purchase land to effect permanent improvements on it.²

1. *For agricultural purposes.* Such credit is needed for the purchase of seed, manure and fodder; payment of rent, wages, revenue, cess and other charges; irrigation of crops, hire charges of pumps and purchase of water; purchase of live-stock and effecting other land improvements; repairs of agricultural implements, machinery, transport equipments, farm houses, cattle sheds, repairs of wells and other irrigation services; laying of orchards; for reclamation of lands and construction of irrigation wells, tanks and embankments; and other capital expenditure on agriculture.

2. *For Non-Farm Business purpose.* Such credit is needed for repair of production and transport equipment and furniture; current expenditure in non-farm business; purchase, construction, and repair of building or non-farm business; purchase of farm equipment and other capital expenditure on non-farm business.

3. *For meeting Family Expenditure.* Such credit is needed for purchase of domestic utensils and clothings; paying for medical,

¹ Duggan, J. W. and Battles, R. V., *Financing of Farm Business*.
² R. B. I. *Rural Credit follow-up Survey; General Report*, 1959-60, p. 32.

educational and other family expenses; purchase, construction and repair of residential houses; and expenses relating to death and marriage and other ceremonies and litigation expenses.

4. *Other purposes.* These include purchase of building and ornaments; shares and debentures of cooperative societies; deposits with cooperative societies, private money lenders and traders; unspecified purposes; and payment of old debts.

(B) According to the Length of the Loan Period

From the point of view of the length of the loan period, agricultural credit may fall into three categories, viz.,

1. *Short-term credit*, which is needed normally for short period of less than 15 months to meet current expenses of cultivation, to facilitate production and for meeting domestic expenses. For example, a farmer may need credit to buy seeds, fertilizers and fodder for cattle. He may also require funds to support his family in those years when the crops have not been good or adequate for the purpose. Such *short-term loans are normally repaid fully after the harvest*. They are recoverable out of the sale proceeds of the crops concerned.

According to the recommendations of *V. L. Mehta Committee on Cooperative Credit* "short-term production loans should be advanced on the basis of sureties only." In some states such as M. P., Kerala and Orissa, however, even such loans are being provided on mortgage of land. In Bihar and W. Bengal a member can borrow upto Rs. 200/- only on surety basis and has to offer mortgage security for loans exceeding this amount.

2. *Medium-term loans*, which are required for medium period ranging between 15 months and 5 years for the purpose of making some improvements on land, buying cattle, agricultural implements, gardening, fencing, plantation etc., purchase of shares in cooperative sugar factories, pig breeding, sheep and goat rearing, purchase of storage bins and purchase of rubber rollers under agricultural machinery.

The *Mehta Committee on Cooperative Credit* recommended that medium-term loans upto Rs. 500/- should be given on the basis of sureties. Loans above Rs. 500/- but less than Rs. 1000/- be given on the basis of creation of charge on land, and loans in excess of Rs. 1000/- be given against mortgage security. This recommendation was reiterated by the *Functional Committee on Cooperative Agricultural Credit* (1964). Since 1968, the limit of Rs. 500/- has been raised to Rs. 1000/- and that of Rs. 1000/- to Rs. 1500/- Medium-term loans for wells, pump-sets, power sprayers and tractors can be advanced upto Rs. 3500/- on personal security. In April, 1971, it was decided that medium-term loans to small farmers may be advanced on personal security, upto Rs. 2000/-.

These loans are larger than short term loans and can be repaid over a longer period of time. The period of loan is generally linked up with the period of serviceability of the assets to be procured with the loan but normally it does not exceed 5 years.

3. *Long-term loans*, which the farmer need for the purpose of buying additional land; to make permanent improvements on land like reclamation and bunding, construction of farm house, cattle and machine-sheds, horticulture, tractors, oil engines, machinery for crushing sugarcane, manufacturing of gur, consolidation of holdings, purchase or acquisition of title to agricultural lands by tenants, etc. to pay off old debts and to purchase costly machinery. Such loans can be repaid only out of the extra income secured by the investment on land. Therefore, *these loans are for long periods of more than 5 years, ranging from 15 to 20 years.*

It may be observed that almost all types of credit are needed by the farmer at different stages of farming. *But the pressing need is the provision of long and medium term credit as the same is not readily available to him.*¹

(C) According to Security

On the basis of the security offered, agricultural credit can be classified into following categories :

(1) *Farm Mortgage Credit*, which is secured against land by means of a mortgage of land.

(2) *Chattel and Collateral Credit*, the farmer is given on the security of the farmer's livestock, crops or warehouse receipts, and the latter on the security of other kinds of property such as shares, bonds and insurance policies.

(3) *Personal Credit*, which is advanced on the promissory or personal notes of the farmer with or without another's security or guarantee. The Rural Credit Survey Committee found that about 50% of the families surveyed were willing to offer their immovable property as security, of the rest about 25 p.c. indicated personal security and remaining families did not specify the type of security which they had to offer.

It is worth noting that security loans may be either individual or collective. For instance, in the case of Land Development Bank, the debentures it issues are secured both against the resources of the bank, and all the mortgages against which it has advanced loans. The individual loans of the Bank are secured by means of individual mortgages but the Bank's bond holders or creditors enjoy a collective security. Similarly, in cooperative credit societies of the Raiffeisen type, farmers borrow on their collective security. *The principle of mutual guarantee is the characteristic of all cooperative credit societies.*

1. Tardy, L. M., *System of Agricultural Credit and Insurance*, 1930.

Another thing to be noted is that the nature of security demanded by the lender depends upon the length of the period for which loan is required. As a general rule, *the longer the period for which loan is required, the more tangible is the security needed by the lender.* Thus, long-term loans are usually advanced on the security of land, while medium and short-term loans are made on collateral or personal security.

In sum, it may be said that the relative importance of different types of agricultural credit varies in accordance with a number of factors such as the country, the land tenure, and the kind of farming practised etc. For example, in countries like Australia, U.S.A., U.S.S.R., and New-Zealand, where land is being settled and developed, long-term credit is more important than short-term or medium-term credit and the same is true of the sharer farmer. The amount and type of credit need also varies from one type of farming to another. Thus, a smaller amount but a large proportion of long-term credit is needed on dairy farms than on sheep or cereal farms.

Requisites of a Good System of Credit to Agriculture

Agriculture credit to serve a really good purpose, should according to Louis Tardy;¹ conform to the following criteria :

(1) It should be granted for a sufficiently long time, commensurate with the length of operation which it is desired to facilitate.

(2) It should ensure an equalisation of credit terms, i.e., it must be available at rates comparable to those paid by other industries.

(3) It should be adequately secured in order to avoid any abuse of credit facilities but the security should not necessarily be material.

(4) It should be adapted to the average yield and capacity for the payment of the farms, particularly during the periods of economic depression.

(5) It should be placed in the hands of the directors who have received special training and had actual banking experience.

In India, the Rural Credit Survey Committee has suggested the following requisites which the agricultural credit system should satisfy :

- (i) It should be associated with the policies of the State.
- (ii) It should be an effective alternative to the private agencies of credit.
- (iii) It should have the strength of adequate resources and of well trained personnel.

1. Tardy, L., *System of Agricultural Credit and Insurance*, 1930.

(iv) It should lend not merely on security of land and other usual forms of security but also on the security of anticipated crops.

(v) It should be such that it helps in the effective growth and development from the village upwards of the cooperative form of association.

(vi) It should effectively supervise the use of credit and constantly bear in mind the borrower's legitimate needs and interests.

From our point of view, a good system of credit to agriculture should also satisfy the following conditions, besides those given above :

It should satisfy the principle of convenience to the farmer, i.e.

(a) *Provision should exist for the supply of all the three types of credit* needed by the farmer viz., long-term, medium-term, and short-term credit.

(b) *The loans advanced to the farmer must be adequate for the purpose for which they are needed*, else other sources will have to be tapped by the farmer at his own peril.

(c) *The loan must be available at short notice*, such as the loan for the purchase of seed and manures at the beginning of the cultivation season rather than 3 or 4 months after.

(d) *The credit system should be elastic*, i.e., it should be capable of expansion during the busy season and a system should be devised whereby crops in maturity or transit to the market may be used as security against the issue of loans.

(e) *It should safeguard the equity of the farmer* in the event of his being declared insolvent i.e., when his property is sold for non-payment of his loan, provision must be made to secure for him a fair price and to return to him any balance that may be left over after the claims of his creditors and the costs of liquidation have been met.

(f) The capacity of credit institutions to act as a buffer^{*} or to spread risks is one of the important tests of a good system of credit to agriculture.

Credit Requirements in India

Though it is rather difficult to estimate the credit requirements for short and long-term needs of agriculture, yet various efforts have been made to estimate the quantitative dimension of agricultural credit. Some of the important estimates are given below :

1. *The All-India Rural Credit Survey Committee (1954)* had placed the total agricultural credit requirements at Rs. 2,000 crores. Of this amount Rs. 800 crores was to be self financed; and the remaining Rs. 1,200 crores were to be supplied by the agencies extending credit to the farmers.

2. *The Working Group* (1965) set up by the Agricultural Production Board of the Government of India, estimated the total credit need of agriculture at Rs. 1,160 crores (for 1970-71.)

3. The Panel of Economists (under the Chairmanship of Prof. M. L. Dantwala) on the basis of the value of agricultural produce and the expenses incurred, estimated the agricultural credit requirements somewhere between Rs. 1,011 crores and Rs. 1,174 crores. The short-term requirements were estimated to the order of Rs. 1,000 crores in 1966-67 and these were to touch the level of Rs. 1,200 crores or more in 1970-71. The medium-term and long-term credit requirements were placed at Rs. 100 crores and Rs. 160 crores respectively per year.

4. *The State Bank of India* (in its *Monthly Review*, Feb., 1968) expected the financial requirements of agriculturists by 1970-71 to be of the order of Rs. 1,200 to Rs. 1,300 crores of short-term type, Rs. 480 crores of medium-term type and Rs. 5,555 crores of the long-term type.

5. *The Ministry of Food and Agriculture* estimated the total credit requirements for short, medium and long-term purpose at Rs. 3,200 crores at the end of 1973-74. Of this Rs. 1,550 crores have been estimated to be short term credit requirement and Rs. 1,650 crores as medium and long-term requirements.

6. *The all India Rural Credit Review Committee*, (1969) estimated the total short-term-credit requirements of agriculturists in 1973-74 as Rs. 2,000 crores and Rs. 500 crores for medium term and Rs. 1,500 crores for long term. Thus the total credit requirements of agriculture were put by the Committee at Rs. 4,000 crores in 1973-74.

7. *The Fifth Plan* has put the targets of agricultural credit at Rs. 3000 crores for short-term requirements; and Rs 2,400 crores for medium and long-term requirements (for 1973-74 to 1978-79).

8. *The National Commission on Agriculture* has placed the total long-term, short-term and medium-term requirements to the extent of Rs. 9,400 crores by 1985.

These estimates indicate the magnitude of the credit requirements for agriculture. It should be noted that because of the occurrence of drought conditions in many parts of the country and floods in others, and also because of the introduction and extension of new agricultural technology, the credit needs would be very high indeed for future.

Agencies supplying Agricultural credit

The short-term and medium term financial requirements of Indian farmers are met through loans borrowed from money-lenders, co-operative credit societies, and from the Government. For long

term requirements, the farmers depend upon the money lenders, land development banks and the Government.

The following table gives an indication of the extent to which different agencies of rural credit contribute to the total borrowing of cultivators, non-cultivators and all rural households.

Sources of Agricultural Credit (In percentage)¹

Sources of Credit	Cultivators		Non-cultivators		All Rural households	
	1951-52	1961-62	1951-52	1961-62	1951-52	1961-62
Government	3.3	2.6	1.5	0.6	3.1	2.3
Cooperatives	3.1	15.5	11.5	5.3	2.9	13.8
Relatives	14.2	8.8	15.5	8.9	14.4	8.8
Landlords	1.5	0.6	4.9	1.2	2.0	0.7
Agriculturist money lenders	24.9	36.0	24.8	23.0	24.8	33.9
Professional money lenders	44.8	13.2	38.0	10.6	43.8	12.7
Traders and agents	5.5	8.8	9.9	16.4	6.1	1.01
Commercial bank	0.9	0.6	2.0	1.4	1.1	0.7
Others	1.8	3.9	1.9	32.8	1.8	17.07
Total	100.0	100.0	100.0	100.0	100.0	100.0

The loans advanced by agricultural and professional money lenders to cultivators are the most important; but their significance has come down from 70.0 p.c. to 49 p.c. In 1951-52, the cooperative supplied a little more than 30 p.c. of the total financial needs of the farmers; but in 1961-62, they raised their share to 15.5 p.c. By 1969-70, the cooperative emerged as the main institutional agency for agricultural credit, supplying about 33 p.c. of the total credit. The share of commercial banks was only 0.9 p.c. in 1951-52, and it declined to 0.6 p.c. in 1961-62 but in 1969-70, it increased to 5.2 p.c.

RURAL INDEBTEDNESS

Rural indebtedness has long been one of the most pressing problems of India. Rural people have been under heavy indebtedness of the village moneylenders and sahuikars. The burden of this debt has been passed on from generation to generation in as much as the principal and interest went on increasing, for most of the debt has been unproductive. According to Wolf, "The country has been in the grip of mahajans. It is the bend of debt that has shackled agriculture."

¹ 1. R.B.I. *Report of the All India Rural Credit Review Committee*, 1969 p. 100.

Estimates of Rural Debt Prior to Independence

Estimates of Indian agricultural debts were made from time to time. No scientific and systematic treatment of the disease was attempted till the seventies of the last century when the indebtedness of the Deccan ryots, who had been the victims of great vicissitudes of famine almost since the conquest of the Deccan rose to such magnitude as to demand prompt legislative action.¹ The Deccan Ryots Commission in 1875, concluded that 1/3 of the occupants of Government land were in debt and that the average debt per occupant was Rs. 371.² According to the Famine Commissions of 1880 and 1901, at least 4/5 of the cultivators were in debt, and were fast losing the possession of their lands.³ In 1911, Edward MacLagan estimated the total agricultural debt of British India at Rs. 300 crores,⁴ while in 1923 Mr. Darling estimated it at Rs. 600 crores.⁵ On the basis of the estimates of the Provincial Banking Enquiry Committees, the Indian Central Banking Enquiry Committee in 1934 put the figure of total rural indebtedness of India at Rs. 900 crores. During the slump the burden of debt became twice as heavy as the cultivator's income was reduced by half. Since then it has increased considerably and was estimated at Rs. 1,200 crores in 1935 by Dr. P. J. Thomas. "If the total agricultural debt of British India was about Rs. 900 crores in 1929-30 it must have increased to about Rs. 2,200 by 1933, and the real burden must be tantamount to Rs. 2,200 crores, assuming that prices fell by 50 per cent (between 1929 and 1933), that no payments of the principal has been made and that interest payment is in arrears so that the debt has accumulated further."⁶ The immediate effect of agricultural depression of the early thirties was to intensify the burden of debt and to increase it not only in real terms but also in money-terms.⁷

The Agricultural Credit Department of the Reserve Bank of India (in a survey of the position in 1937) noted that "the burden of indebtedness became really much more crushing than could be judged from a comparison of the growth of its volume in rupees owing to the great depression (1929-32) attended with falling prices of agricultural produce. They put it at Rs. 1,800 and the annual interest on these on the lowest computation was to be above Rs. 100 crores. To these may be added canal rates (about 12 crores), central and provincial taxation (about 100 crores), local taxation (about 150 crores) and railway freight charges (Rs. 65 crores). Precious little is, therefore, left to feed the cultivators." During World War II, the substantial cultivators and big landlords everywhere repaid their old

1. S.C. Ray, *Agricultural Indebtedness in India*, p. 3.
2. *Deccan Ryots Commission Report*, p. 29.
3. S. C. Ray *Op. Cit.* p. 21.
4. *Bombay Banking Enquiry Committee Report*, p. 58 (F. N.)
5. M. L. Darling. *The Punjab Peasant in Prosperity and Debt*, 1932, p. 18.
6. P. J. Thomas, in *Economic Problems in Modern India*, Vol. 1, 1939, p. 165.
7. D. R. Gadgil, *Agricultural Finance Sub-Committee Report*, 1948, p. 6.

debts either in full or to a material extent. For India as a whole the real rural debts and also the total money burden became lighter during war years. The regions and classes that failed to profit from the unprecedented rise of prices of agricultural produce evidently did so because of structural defects in their economics such as uneconomic holdings.

It had been difficult to arrive at an estimate of the total all-India debt in view of different conditions prevailing in different States. But on the basis of Madras Enquiry made by Dr. Naidu, if the same proportion of debt is applied to the whole of the country on population basis, the total rural debt in 1945 worked out at Rs. 1,300 crores and if an allowance was made for the loss of area to Pakistan and differences in conditions of different States were ignored, the estimate for the whole of Indian dominion would be round about Rs. 1,100 crores. The First Report of the National Income Committee estimated the rural debt at Rs. 915 crores, of which about 83 per cent was non-productive and only 5 per cent of which was supplied by cooperative societies. The interest on this debt was estimated at Rs. 86.5 crores. S. Thirumalai put the amount of debt roughly at Rs. 1,800 crores.

Various estimates arrived at of the rural indebtedness may be summarised as follows:

Estimates of Rural Indebtedness Prior to 1947

Estimated by	Year of enquiry	Amount of indebtedness in rupees	General Remarks
<i>Pre-Independence</i>			
The Deccan Ryots Commission	1875	371 per occupant	Based on analysis of 12 villages in the Ahmadnagar District (Bombay) one-third occupants of Government land in debt; debt averaged 12 times the assessment.
The Famine Commission	1880		One-third of land-holding class in deep debt, another one-third in debt but with power to redeem debt.
Sir Frederick	1895	45 crores	Of Madras only.

The Famine Commission	1901		One-fourth lost their land in Bombay. Less than 1/5 free from debt.
Sir Edward Maclagan	1911	300 crores	For British India on the basis of Sir Nicholson's estimate for Madras.
M.L. Darling	1925	600 crores	Based on the Punjab figure of Rs. 90 crores; 19 times the assessment, but taking 17 as the multiplier.
The Central Banking Enquiry Committee	1929	900 crores	Based on Provincial Banking Enquiry Committee Reports.
P. J. Thomas	1963	2,200 crores	
Mr. R. K. Mukerji	1935	1,200 crores	
Agricultural Credit Department	1937	1,800 crores	
Mr. E. V.S. Menon	1938	1,800 crores	
Dr. S. N. Naidu		1,100 crores	For whole of Indian Union.
National Income Committee		913 crores	Ditto
Thirumalai		1,800 crores	Ditto.

Debt Estimates in Post-Independence Era

The *Rural Credit Survey* of the R. B. I. undertook an enquiry in 1951-52, which provided some interesting data. The highlights of this survey were¹:

(i) The proportion of borrowing families among the rural families was 51.7 per cent. The proportion of borrowing families was larger among cultivators than among the non-cultivators.

(ii) About 63 per cent of the rural families were in debt, and the average amount of debt per family was Rs. 283.

(iii) The burden of debt was much higher on cultivators with smaller holdings as compared to cultivators with larger holdings.

1. *Rural Credit Survey Committee Report*, Part II.

(iv) The average amount of outstanding debt per family varied from Rs. 29 to Rs. 1,200.

The *Rural Credit Follow up Survey* (1956-57) concluded that the data revealed "the general trend of an increase in the volume of debt during the year covered by the investigation."¹

According to the *All-India Rural Debt and Investment Survey*, the average debt per household for the country as a whole was about Rs. 654, the incidence being more among cultivators (Rs. 719 per household) as compared to non-cultivators (Rs. 429 per household). The level of debt per household was markedly high in Punjab, Rajasthan, Gujrat, Andhra Pradesh, Tamil Nadu and Karnataka, and relatively low in Bengal, Kerala, Orissa, Assam and J and K. Barring a few States the level of debt per household was lower among non-cultivators than among cultivators.

An examination of the outstanding debt of cultivators in relation to their cultivating holdings, revealed that incidence of debt per acre was highest in Tamil Nadu followed by Kerala, Andhra and Bihar. In all these States, debt per acre of cultivated holdings exceeded Rs. 100. At the other extreme, debt per acre of cultivated holdings was very low in Madhya Pradesh, Rajasthan, Maharashtra, Orissa and Assam.

The Reserve Bank conducted an *All-India Rural Debt and Investment Survey* (AIRDIS) in 1961-62, nearly 10 years after the All-India Rural Credit Survey (AIRCS). According to the Reserve Bank's surveys, during the decade ended 1961-62, the percentage of indebted households to total house holds in rural India did not show any sizable variation; it remained between 67 to 69 for cultivators and at 52 for non-cultivators. The average debt for an indebted household recorded an increase from Rs. 447 in 1951-52 to Rs. 647 in 1961-62, nearly 46 per cent rise. While the average loan for cultivator household increased from Rs. 526 in 1951-52 to Rs. 708 in 1961-62 (by about 35 per cent), that in the case of a non-cultivator household increased from Rs. 249 to Rs. 430 during the period or by about 73 per cent.

Debt per indebted rural household (RBI Surveys)

	Cultivators		Non-cultivators		(In Rupees) All Households	
	1951-52	1961-62	1951-52	1961-62	1951-52	1961-62
Andhra Pradesh	912	908	220	348	640	755
Assam	308	334	274	409	302	349
Bihar	454	605	163	335	296	554
Gujarat	567	868	381	653	528	811
Jammu & Kashmir n. a.		389	n.a.	424	n.a.	391

1. *General Review Report of Rural Credit Survey Committee*, p. 73.

Kerala	403	418	131	124	239	372
Madhya Pradesh	n.a.	657	n.a.	389	n.a.	614
Tamil Nadu	912	1081	220	400	640	870
Maharashtra	576	700	381	269	528	609
Karnataka	528	972	334	490	495	868
Orissa	180	391	94	263	157	370
Punjab	743	1277	361	797	607	1090
Rajasthan	780	1031	578	1138	746	1043
Uttar Pradesh	459	478	260	374	422	459
West Bengal	261	343	170	286	230	227
All India	526	708	249	430	447	647

N. B: [(i) Figures for 1951-52 for Andhra Pradesh and Tamil Nadu relate to former composite Madras State.

(ii) Figures for 1951-52 for Gujarat and Maharashtra relate to former composite Bombay State.

(iii) Figures for 1951-52 for Kerala relate to the old State of Travancore-Cochin.

(iv) n.a. not available.]

The incidence of outstanding debt, measured in relation to the value of recorded assets, was less than 50% of the assets in Assam, Orissa, Jammu and Kashmir and Kerala. In Tamil Nadu, Rajasthan Karnataka and Punjab, the proportion even exceeded 70%. The proportion was higher among cultivators than among non-cultivators in all states.

Thus, it is striking to note that the indebtedness of the peasantry in spite of great improvements in communication, trade, irrigation and maintenance of peace and security rather increased than decreased and it apparently seems paradoxical to say that peasants had become prosperous prior to recent depression than before, but as history reveals indebtedness and prosperity are not necessarily inconsistent, the only explanation of this phenomenon is that indebtedness still existed in rural India not in spite of these improvements but just because of them. It is no wonder that the small rural farmer is in no better position today financially than he was before the war, despite the steep rise in agricultural prices, but along with the rise in prices there has also been a rise in the prices of consumers' goods and also in the cost of cultivation including wages, price of cattle implements, etc. Moreover, not all the benefits of rising prices has gone to the cultivator.

The recent Reserve Bank of India Report on All India Debt and Investment Survey (1971-72), after collecting data from more than 1 lakh rural households selected from about 12,000 sample villages, gave stunning data on indebtedness by asset groups. The average liabilities per household were Rs. 503 in contrast with average assets per household of Rs. 11,343 i.e., unit households liabilities formed only 4.34% of unit household assets.

Proportions of households reporting and average value per household of individual items of assets and liabilities as on 30th June, 1971.
All Households

Assets/liabilities	Proportion of households reporting (per cent.)	Average value per household in rupees
Land	70.74	7511.96
Vacant house site	7.90	49.46
Building	93.31	2040.06
Livestock	75.26	733.02
Implements & machinery	77.57	3 0.03
Durable household assets	94.76	522.50
Shares	14.24	20.05
Deposits	6.89	106.01
Cash	3.30	47.56
Kind	0.76	2.79
Total assets	99.61	11343.34
Cash payable	40.95	490.62
Kind	5.96	12.45
Total liabilities	42.87	503.07

About 43% of the households were in debt. This proportion is substantially lower than that observed in 1961-62 when nearly 63% were indebted in some form or the other. Though the proportion of rural households steeped in debt has gone down in the last ten years, academic studies show that the lot of small farmer or the peasant even in prosperous states like Punjab has become worse today. The small cultivators, labourers and peasants have not at all benefited by institutional finance which has conferred certain advantages only on the well-to-do farmers. Since security still forms the basis of financial dealings, poor peasants are totally excluded from new developments and usually are left to the mercy of professional moneylenders.

The RBI survey classifying the asset groups into broad social strata found that absolute poverty existed upto the figure of Rs. 5000 while middle income group exists upto Rs. 30,000 and rich or very rich in the region of about Rs. one lakh. The debt burden is the heaviest on the poorer segment of the rural community, around 10% of the total assets, the burden declines with the volume of assets.

The liabilities totalling Rs. 3,921 crores as on June 30, 1971 were accounted for almost wholly by cash loans, the share of loans in kind being hardly 2.5 per cent. The proportion reporting liabilities was 46 per cent among cultivator households and 54 per cent household averaged Rs. 612 among cultivators and Rs. 219 among non-cultivators. In the latter group, the average outstandings per household were Rs. 162 for agricultural labourers and Rs. 261 for artisans.

In all these groups, the outstanding liabilities were small in relation to the value of total assets, the debt assets, ratio being 4.2 per cent for cultivator households, 14.2 per cent for agricultural labour households and 11.0 per cent for artisan households. For all the non-cultivator households put together the ratio was 8.4 per cent.

Recent survey of the UNI shows that about 65 to 70% of small farmers, rural Harijan and adivasi households are steeped in debt and freely exploited by village moneylenders. Agricultural needs have contributed to more than half the debt incurred by these families, domestic consumption expenditures account for the rest. The average debt of a family varies from Rs. 250 to more than Rs. 500.

Sources of Rural Debt

Without doubt the village money-lender is still the most important source of borrowing, and even though sometimes he has proved to be a *dangerous necessity* he has been and still is, an *inescapable necessity*. According to the findings of the *Rural Credit Survey Committee*, the amount of debt owed to the agriculturist and professional moneylenders form 24.9 and 44.8 per cent respectively of total debts. Relatives, land-lords, traders and commission agents accounted for 14.2%, 1.5% and 5.5% respectively. Debt owed to the Government and co-operatives formed hardly 3.3 and 3.1 per cent respectively. The *Follow-up Survey* confirmed these trends as it was found that the borrowings from private agencies, which was nearly 92% during the earlier survey ranged, in 1956-57, from 49% to 99%, while the proportion of outstanding debt to those agencies to total debt was equally high.

The role played by different agencies in supplying loans to the cultivators is brought out in the table below :

Credit Agency	Proportion of Borrowing from the Agency to the total borrowings of the cultivators, etc.		
	Cultivators	Non-cultivators	All Families
1. Professional moneylenders	44.8	38.0	53.8
2. Agricultural moneylenders	24.9	24.8	24.8
3. Relatives	14.2	15.5	14.4
4. Traders and Commission Agents	5.5	9.9	6.1
5. Landlords	7.5	4.9	2.0
6. Government	3.3	1.5	3.1
7. Co-operatives	4.1	1.5	2.9
8. Commercial Banks	0.9	2.0	1.1
9. Others	1.8	1.9	1.8
Total	100.00	100.00	100.00

The sources of loans for the cultivators and non-cultivators were :—

	%	%
Agriculturist money-lenders	47.1	38.9
Professional money-lenders	14.9	15.0
Co-operatives	9.9	4.5
Traders & Com. Agents	7.2	10.2
Relatives	6.4	9.2
Government	5.3	3.8
Landlords	0.9	1.3
Commercial Banks	0.4	0.7
Others	7.7	16.3

The recent UNI survey (1975) has shown that while co-operative credit organisations and commercial banks have been making considerable headway in providing institutional credit to agriculturists private moneylenders and traders still continue to provide about 70% of the credit requirements in villages. Further a change has been noticed that the professional moneylenders have been replaced by agriculturist moneylenders and traders. In several villages rich farmers are the principal moneylenders.

The largest simple purpose of loans was : household expenditure representing 49.2% for cultivators (63.6% for non-cultivators). Other purposes in order were capital expenditure in farm business 26.8% (6.9%); current expenditure in farm business 9.8% (1.8); repayment of debt 5 (4.4) current expenditure in non-farm business 2.1 (16.7) expenditure on litigation 1.8 (1.0), capital expenditure in non-farm business 1.4 (0.5); more than one purpose 3.0 (1.2) and purpose not specified.

An important aspect of rural indebtedness is its use. According to the All-India Rural Credit Survey Committee, 56.3% of the debt is for unproductive use. In case of farming households alone, it has been estimated at 53.4%. For non-farming households this percentage has been put at 74.

It is important to note that the All-India Debt Investment Survey (1971-72), puts the annual credit needs for unproductive purposes at Rs. 340 crores for the poorest slabs comprising landless labourers, rural artisan and small farmers with holdings upto half an acre, and Rs. 250 crores for marginal farmers with holdings from 1/2 to 5 acres.

The Sivaraman Committee, 1976, considers these estimates on the high side. It puts them at Rs. 170 crores and Rs. 125 crores for the respective slabs.

Thus, it should be noted that :

(i) majority of the rural households are under debt.

- (ii) there has been an increase in rural indebtedness.
- (iii) Substantial part of the debt is used for unproductive purposes.
- (iv) The poorest section of the rural population is severely hit by debt.

Causes of Indebtedness

1. **The Ancestral Debt.** The most important and the chief cause of the existing indebtedness is the ancestral debt, which is handed over from father to the son generation after generation without any equitable restrictions. Children born in debt are found making very feasible efforts to pay the debt of their fathers and forefathers. They are probably ignorant of the law that the debt of the deceased pass on to the heir only to the extent of the property inherited by the latter, and if no property is inherited there is no liability to pay the debt but a pious obligation.¹ The only existing facilities for the redemption of this debt is the borrowing of money, from one money-lender to pay off another and thus increase the debt. Many agriculturists start their career with a heavy burden of ancestral debt and drag the loan for the whole of their lives, taking it to be a religious and social obligation, with the result that the burden goes on increasing and becomes hereditary. As the Royal Commission on Agriculture remarked "The Indian peasant is born in debt, lives in debt, dies in debt and bequeaths debt"² Thus, *an Indian cultivator takes birth as a debtor, lives as a debtor and dies as a debtor.* In fact, the people are so accustomed to take it over from their fathers and to pass it on to their sons, that they accept indebtedness as a settled fact and a natural state of life.³

2. **Sub-division and Fragmentation of Holdings.** When the holdings are small, the cultivation ceases to be economical even in the best of years and the yield from land becomes insufficient for the maintenance of the farmer and his family. On account of this reason either the farmer must go in debt or must be very industrious or must have any other source of income. In this connection it would be interesting to quote Mr. Darling who remarked. "That to support a family upon a few acres without getting into debt requires a love of skill, industry and thrift seldom attained in a hot county. Undoubtedly it can be done just as a small sailing boat weathers a storm of the Atlantic, but unless the boat is both well found and well manned it will assuredly sink. In India the farm is too often neither the one nor the other, and nature can be almost as destructive on land as at sea".⁴

The holdings are so small and the margin of safety so narrow that any misfortune may plunge the peasant into debt from which he

1. *Central Banking Committee Report*, p. 61.
2. *Royal Commission Report on Agriculture*, p. 365.
3. *Darling, Peasantry in Prosperity and Debt*, p. 262.
4. *Darling, Op. Cit.*, p. 27.

can never extricate himself. A series of bad years, the death of cattle or mere carelessness may lead to debt while in best years the surplus produce is so small that the interest is paid with difficulty and for the principal there is no scope. Indeed, life is hard and bitter to the cultivator who has to depend on his few acres to support himself and his family.

3. Vagaries of the Climatic Conditions and Other Calamities. India is subject to frequent failure of rains and the resultant famines. The vagaries of monsoon are proverbial. This makes agriculture extremely precarious industry and makes the budget of the Government a virtual gamble in rains. The frequency of failure of crops due to drought or floods, hailstorms, conflagration, the uncontrollable swarms of locust all these damage agriculture and show poor results, which cause endless miseries to the cultivator, having no reserves to fall back upon in times of distress, and hence he becomes the prey of moneylender who exploits him according to his will. It is only in good year that the ordinary small holder can possibly keep himself out of debt¹. To a farmer there is no calamity greater or more severe than the total or partial failure of crops. When the rain fails there is nothing but complete bankruptcy in store² in the bad years he will borrow for nearly everything he wants, for seed, for cattle, clothing and even for his food.

4. Ignorance and illiteracy of the cultivator. To make the matter worse, ignorance and illiteracy easily gives way to the multiplication of procreative processes and thus the population goes on increasing without a corresponding increase in the means of subsistence. Hence, to secure a minimum subsistence for himself and his family, the cultivator borrows. Prof. Wadia says, "Having no additional source of income the ryot continues to borrow in and out of the season thinking to mitigate the heavy load of indebtedness. As a consequence the increase in rural indebtedness has been parallel to the growing loss of economic equilibrium brought about by the pressure of population on the land and decline of subsidiary occupation."

Illiteracy forms one of the principal obstacles to his progress. He easily falls into the clutches of the shrewd and intelligent moneylenders owing to his simplicity and ignorance. It has been said, "The money-lender tempts him to borrow, the lawyer to quarrel and the trader to waste."

5. Failure to Provide for Deficiency. Agriculture is subject to the Law of Diminishing Return and in absence of modern inputs the produce of land goes on decreasing. The extreme poverty of the cultivator and low yield of his tiny plot prevents him from providing against depreciation because it is difficult to put aside funds for depreciation of cattle and improved seeds when so desirable things

1. *Baroda Banking Enquiry Committee Report*, p. 34.

2. Wadia and Joshi, *Wealth of India*, p. 279.

are lacking in the household. In fact taking into account uncertainties of weather, the frequency of cattle mortality, and the fickleness, of prices, agriculture, especially cereal growing, is not a paying business, and if the Indian ryot sticks to it, it is not because it is profitable but because it is a mode of life with him.¹

6. **Low Income of the cultivator.** Poverty and lack of capital are the twin evils from which the entire rural economy suffers. A large number of Farm Management Studies undertaken in India have clearly revealed that the net income of the farmer is very low² in all the size groups; the recorded farm business income is insufficient to cover domestic expenditure³. With this low income the cultivator finds it difficult to satisfy his consumption and production needs. He is underfed, under-clad, under-nurtured and leads from hand to mouth existence. The physical deficiency, resulting from such conditions, make him an easy prey to epidemic diseases which sap his vitality and stamina and this enforced illness and weakness compel him to borrow.

7. **The Moneylender and His Vicious System of Moneylending.** The agricultural capital is supplied at present mostly by the village money-lender, mahajans and sahu-kars. A large number of cultivators appears to have a running account with the mahajan. He advances them loans and seeds giving one seer less than the market price. When the tenant falls on evil day he would advance rent to save him from ejectments. He also lends money for the inevitable marriage and for equally inevitable law suits. He is in fact, at all times, the resource to which the needy agriculturists go for relief, and the consequence is that he is never out of the mahajan's grip, i. e., they are almost the only basis of thrift in the vast desert of extravagance and destitution and the only source from which the credit can be had, so that he is always in the clutches of the moneylender.⁴

1. P. J. Thomas, *The Problems of Rural Indebtedness in India*, p. 6.

2. *Studies in Economics of Farm Management in Madras*, 1955-56, p. 175.

"The total per capita monthly income of cultivating households, having 1.50 to 2.50 acres of ownership holding, was calculated at Rs. 8.7. It was only Rs. 5.4 for those who had 1 to 1.50 acres of land and Re. 0.6 for those whose ownership holding was less than one acre."—G. C. Mandal, *Studies in the Problem of Growth of a Rural Economy*, 1961, p. 66.

3. *Bombay Banking Enquiry Committee Report*, Para, 63.

4. Wolf, *Co-operative in India*, p. 3.

"The Gross farm output in the Sarda Canal U. P. worked out at Rs. 270.87 per acre in the irrigated and Rs. 249.51 per acre for the inputs in the unirrigated areas as against Rs. 156.91 and Rs. 151.55 per acre of inputs in the same areas respectively. The value of the net farm output thus worked out at Rs. 113.96 and Rs. 98.16 acre for these two areas."—B. Singh and S. D. Misra, *Benefit Cost Analysis of the Sarda Canal System in U. P.*, p. 91.

"In the Punjab, the total average income per annum was found to be Rs. 270.44 per family consisting of 6.2 members on an average.—The Board of Economic Enquiry Publication No. 93, *Effects of Bhakra Dam, Irrigation on the Economy of the Barani Villages in the Hissar District*, 1960-61 p. 102.

"The net output, in the Cauvery-Mettur region of Madras worked out to Rs. 113.64 per acre in the irrigated areas and only Rs. 1.77 per acre in the unirrigated areas.—K.S. Sonachalam, *Benefit Cost Evaluation of Cauvery-Mettur Project*, p. 39.

8. High Rates of Interest. The high rates of interest also compel the cultivators to borrow. The rates vary from State to State and on account of the weakness of the peasant's economic position the interest accumulates every year. The rates varied from 9 to 12% in Tamil Nadu on secured and from 18 to 24 per cent unsecured loans; 25 to 50 per cent in Bihar, Orissa and Assam. The Bombay Enquiry Committee gave the sowcar's rates for different tracts in Maharashtra (irrigated tracts) 12 to 34 per cent; Maharashtra (famine tract) 18 $\frac{1}{2}$ to 36 per cent; Gujarat 9 to 18 per cent. The common rates on secured and unsecured loans in Bihar and M. P. are 15 to 18 per cent and 10 to 15 per cent respectively. According to U. P. Committee the rate for secured loans varies from 6 to 18 per cent (12 per cent being the most common figures) and for unsecured loan vary from 18 to 37 $\frac{1}{2}$ per cent (the most common rate being 24 per cent). Frequently the loans advanced are in kind either for food or for seed usually on *sawai* or *deorha* rates and if unfortunately the crop fails to give the normal yield then the cultivator has to face starvation because he has to satisfy the mahajan's claim in full as prearranged. But if he does not do that then the loan shall go on accumulating on compound interest and become hereditary for the interest is 25 to 50 per cent or even 100 per cent sometimes.

9. Extravagant and Improvident Borrowing. The improvident borrowing is another fruitful cause of his indebtedness. Although the Indian peasant lives normally a most frugal and abstentious life, he is undoubtedly apt to carry on his expenditure to extravagant limits. The methods in which the peasant spends his money are extremely unmethodical and baneful. He squanders his money extravagantly in unproductive consumption like social ceremonies, upon marriage, ornaments, funeral rite, *sradh* ceremonies of ancestors, etc., which is often beyond the means of the cultivator. The long series of seasonal feasts, religious observances as *kathas*, as well as caste dinners on auspicious occasions have stimulated family extravagance. The absence of self-help and thrift, and abundant harvests have produced the habit of wasting long periods in gossips and encourage thriftlessness. All these have played an important part in fostering improvement in the amount of debt.

10. Litigation. In places where there are great fluctuations of harvest every lawyer knows that his income will contract or expand in relation to the quality of the harvest; which is a sign that the villager is quick to go off to the courts when he has spare cash in his pocket. Mr. Calvert estimated that 2 $\frac{1}{2}$ million persons attended the courts every year, either as parties or as witnesses and that three or four crores were wasted in the process.¹ In these connections not only have the pleaders to be engaged and stamp duty and process-fees to be paid, but petty officials have to be propitiated, witnesses may have to be hired, as much to prove what is true as to establish what

1. *Wealth and Welfare of the Punjab*, p. 206.

is false, and perhaps the support of an influential neighbour has to be gained all of which consumes both time and money. Really speaking, the passion for litigation is another undesirable trait of Indian peasant which adds to his poverty and unproductive debt. "It is not uncommon to hear of suits dealing with the minutest fraction of an acre being fought up to the High Court and of criminal cases involving the expenditure of thousands of rupees."¹

11. Heavy Burden of Land and Irrigation Taxes. The land revenue policy of the Government has also been responsible for the indebtedness. In this connection the Famine Commission of 1901 reported. "The rigidity of the revenue system forced the cultivators to borrow while the valuable property which they hold made it easy to borrow." Mr. R. C. Datta, in his famous open letters in 1901 pointed out that "land in India is generally assessed very high, and since India is greatly an agricultural country, if the soil be so heavily taxed, the people would be impoverished... . Therefore unless provision for suspense and remission of revenue be made the cultivators will be forced to borrow under conditions beyond control." According to Mr. Darling, land revenue demand was lowered with the advent of the British rule but it was not lowered enough to suit the less elastic system of collection. This increased indebtedness. Thus "the heavy land assessment with its rigid procedure of collection is largely responsible for the aggravation of the indebtedness"²

12. The Absence of Adequate Marketing Facilities. The money economy and higher prices ruling in the market tempts the peasant to dispose of all his produce without any reserve at a cheaper price and in a restricted market, and the poor fellow has to borrow or to buy his food in times of need at a very high price. The untimely revenue demand and constant harassing of the mahajan for payment of interest just at the time of harvest when alone the cultivator is in a position to pay, oblige the peasant to add fuel to the fire by bringing his produce for sale to an already glutted or flooded market at the end of the harvest and spell his own disaster.

The Agricultural Finance Sub-Committee has concluded, from the sample data of the debt surveys in the past, as follows :—

(1) Repayment of old debt is everywhere an important factor in the contraction of new debts. (2) A large part is played by unproductive debt. Everywhere social and ceremonial expenditure is seen to be responsible for a considerable percentage of debt. (3) Consumers' needs and 'distress circumstances' are seen to assume an important role in adding to total debt. (4) Debt for improvement purposes is almost everywhere of an insignificant proportion.

1. Darling, *The Punjab Peasant in Prosperity and Debt*, p. 76.

2. Wadia, P.A. and Joshi, *Wealth of India*, p. 280,

Thus it may be said that the *large volume of rural indebtedness has not been the result of any single factor but has been brought about by a variety of causes. At the root of the evil is uneconomic and unproductive borrowing often made inescapable by the absence of adequate institutional credit.* "If the debts of the rural population were incurred primarily for the purpose of improving agricultural productivity, the growth and extensiveness of rural indebtedness would give no cause for alarm. In many countries, however, the heavy rural debts have accumulated chiefly as a result of borrowing to finance consumption."¹

Evils of Indebtedness

The evils resulting from indebtedness may be enumerated as follows :—

(1) The chronic state of indebtedness has influenced the cultivators in many undesirable ways. Much of the evils from which they suffer are the results of the indebtedness. The low standard of living and income and the indigence and poverty of the cultivating classes are due to it. The Central Banking Enquiry Committee writes, "Amongst the classes responsible for the low standard of living of the agriculturist and the continuous impoverishment of this class, even in areas which are blessed with good season and normal crops, indebtedness must be given a high place. This low scale of income and poverty tends to lower the physical and mental vitality of the cultivators, and causes the decay and weakening of the normal fibre of the society. All these lead to agricultural inefficiency and indebtedness coming in the wake of these evils, aggravates them."

(2) Debts also prevent the orderly and profitable marketing of agricultural produce. The defective system of rural finance in which the moneylender is both creditor and village trader leads to inordinately and unprofitable marketing. The indebtedness of the peasant to the moneylender compels him to sell his produce at a pre-arranged price and in a closed and isolated market lacking in competition.

(3) When large sums of money are borrowed for capital improvements or payments of old debts the period of repayment fixed in the bonds is not very long. The result is that the income of the cultivators is utilised more for the payment of debt than is desirable or possible and the cultivator is left with very meagre income even for his subsistence. This leads to unproductive cultivation and is very detrimental to the growth of national wealth.

(4) The indebtedness causes a loss of property and transfer of land from cultivators to non-cultivators, which is fraught with grave economic and social consequence for the future of the country. The

1. I. L. O. *Economic Background of Social Policy*, 1951 pp. 6-7

The General Report of the All India Rural Credit Survey Committee (Abridged Ed.), p. 63.

areas held by non-agriculturists have shown an increase in recent years.

(5) The worst social and moral effect of the indebtedness is that it results in the servitude of the debtor if the moneylender is an influential person and particularly so if he is also a landowner. The borrower has to do free service for him when called upon to do so. In many places money is borrowed by the cultivators with the condition that they would undertake to repay or perform labour on farm and in the houses of the moneylenders until the debts are cleared, and after their death sons are bound by the same agreements to serve. The poor debtors are not allowed to serve anybody so long as work on the money-lender's farm is necessary. In return for those services they get a customary allowance of a few chips per day, coarse food, old clothes and now and then new clothes and rewards on auspicious occasions. Their wives and children are required also to serve the money-lender for a pittance.

The moral integrity and probity of the Indian farmer is tottering under the growing weight of indebtedness. For the inevitability of indebtedness, from which he has not even a remote hope of escape, turns him into a dishonest debtor and inefficient farmer, thriftless head of the family and an irresponsible citizen.

Role of the State in Relation to Debt Relief Measures

Since earliest times, State has taken measures to relieve the distressed debtors. Legal rates of interest were fixed and concessions were offered for higher classes. It was also provided that the amount of interest paid should not exceed double the principal. During the Muslim period, loans were advanced from the State exchequer to the agriculturists in time of drought and pestilence. Many money-lenders also came forward to advance money with the sole purpose of appropriating land of the borrower. The Government had, therefore, to come forward to give protection to the agriculturists. It attempted through the following measures:—

- (a) It tried to remove the need for borrowing:
 - (i) through reducing the effective burden of land revenue, and making its payment convenient through greater elasticity in its administration and collection;
 - (ii) through increasing facilities of irrigation so that the dependence on the vagaries of the monsoon were reduced thereby increasing the average production and the income of the cultivator;
 - (iii) through improving means of communication and transportation and marketing facilities so as to enable the cultivator to obtain a better price for his produce.

(b) It attempted to protect the assets of the agriculturist from passing into the hands of the non-agricultural money-lenders, through Land Alienation Acts (such as that of Punjab in 1900) and earlier acts like the Encumbered Estates Relief Act of 1876, e.g., Chota Nagpur Encumbered Estates Act, 1872; The Jhansi Encumbered Estates Act of 1882; The Sind Encumbered Estates Act of 1896; Bundelkhand Encumbered Estates Act of 1903. These Acts provided for the judicial determination of original principal and allowed only a reasonable rate of interest. They also restricted credit on the mortgage of land. But the moneylenders were prompt to break the regulations of the Act and therefore, the Acts had to be amended with a view to limit the period of mortgage, declare *benami* transactions inoperative; prohibit moneylenders to purchase land of their debtors within 3 years of the final settlement or repayment of the debt. Acts similar to that of Punjab were also passed in Bombay, M. P., Hyderabad and other States. *The Act, however did not achieve much success, though some beneficial results do seem to have followed from restriction on transfers on land to non-agriculturists.*

(c) It took measures to attack directly the power of the money-lender and regulate his activities. Some of the important of these measures were.

- (i) *Under the Deccan Agricultural Act of 1879*, subsequent amendments in the Act were made in 1882, 1886, 1895, 1907, 1910, 1911 and 1912; the Courts were allowed to go behind the contract of debt and to modify it in favour of the borrower so as to reduce an oppressive rate of interest, to prevent sale of land, unless specifically pledged and to restore the land to the cultivator even when there was a sale deed between the two parties. Safeguards to prevent frauds in moneylending, setting up of special machinery to render cheap and summary justice to the ryot and the provision of conciliating the debts in the village courts were some of the other features of the Act.
- (ii) *Usurious Loans Act of 1918* (amended in 1946) tried to improve the legal position of the borrower. Unfortunately this Act did not prove very successful, as the Congress Agrarian Reforms Committee observed in 1948. It said, "laws for restricting the operations of moneylenders have completely failed." As late as 1957, even the Follow-up Rural Survey reported that quite large borrowings were made at rates even higher than 50 per cent. The incidence of the burden of interest was heavier on medium and small cultivators, especially the latter group, than on big and large cultivators.
- (iii) *Regulation of Accounts Act* was passed in 1930 in Punjab and later on these were enacted in various States with a view to protect the debtor from manipulated accounts by

prescribing forms of accounts, and insisting on the debtor being supplied with these regularly. It also laid down that principal and interest must be shown separately so as to enable easier assessment of rates of interest charged.

- (iv) To reduce the excessive rates of interest, maximum rates of interest chargeable were fixed through the *Punjab Relief of Indebtedness Act of 1934*. This Act drew a distinction between *secured* and *unsecured* loans for purposes of rates of interest fixing a maximum rate of interest for each category.
- (v) *Licensing and Registration of Moneylenders*. Various Acts like the C. P. Moneylenders' Amendment Act of 1956, the Punjab Registration of Moneylenders Act, 1938, the Bengal Moneylenders' Bill of 1938, the Bihar Moneylenders' Bill of 1931, the U. P. Moneylenders' Bill of 1939, and the Bombay Moneylenders' Bill of 1938 provided for the registration and licensing of moneylenders. Money-lending without licence was made an offence.

The details for licensing the moneylenders varied for different States. The Rural Credit Survey Committee remarked. What is noteworthy, however, is that licensing itself as a requirement is not uniformly imposed by all States. In Bombay, Hyderabad, Madhya Pradesh, Madhya Bharat, Mysore and West Bengal, it is an offence to carry on the business of moneylending without a licence; in Bihar, Orissa and Punjab, on the other hand, to be an unlicensed money-lender is not to be an illegal one; the effect of not taking a licence is merely to bar access to law for recovery of dues."

- (vi) Voluntary reduction of debts was undertaken in the first instance through the setting up of *Debt Conciliation Boards* in various States but subsequently when it was realised that voluntary conciliations were not having much effect more drastic measures were undertaken. These resulted in the passage of Acts like the Punjab Debtor's Protection, and the Punjab Restoration of Mortgaged Lands Act. The former exempted ancestral property from attachment as also standing crops, while the latter provided for restoration of mortgaged lands on payment of nominal compensation.

It is doubtful whether such measures proved to be beneficial to the cultivators.

The *Rural Credit Survey Committee* held the view that "there is large scale and country-wide evasion of the restrictions imposed on moneylenders. The modes of evasion reported are as numerous as they are ingenious. Some of them are : (a) Obtaining a pronote for a large amount of principal than that actually lent. (b) Interest

computed at illegal rate and deducted in advance from the amount lent. (c) The making of a separate pronote (besides the main one) in the name of a servant or relative of the moneylender to cover the extra interest. (d) Forward purchase, together with false evaluation of the debtor's produce. (e) Conditional sale. (f) Unobjectionable sale deed for purposes of the law and illegal, if informal, understanding so as to the real substance of the contract. (g) Taking over of debtor's land of usufructuary mortgage on terms which in effect imply the charging of illegal interest or taking on mortgage the milch cattle of the debtor on a similar basis.

It was rightly asserted that "Although legislation for the regulation of money lending has been enacted and enforced in most of the States, in practically none of them has any adequate machinery been set up for the specific purpose of ensuring an effective implementation of various measures."..... "Because of the inadequacy of the supervising machinery, absence of an alternative source of credit and the compelling nature of the borrower's requirements, the money-lenders are able without much difficulty to evade almost all important provisions of these enactments."

Debt Relief Under 20 Point Programme

As a consequence of the 20 point programme in July 1975, it has been accepted that "the moratorium on rural debt be put and measures should be undertaken for redemption of debts in case of the very poor and liquidation of rural indebtedness by stages in the case of others among the weaker sections."

It was suggested that liquidation of rural indebtedness has to be carried out in stages. It has recommended total relief from indebtedness in one stage for landless labourers and rural artisans, whose annual household income does not exceed Rs. 2,400 and also for marginal farmers, owning up to one hectare of unirrigated land. Every debt including the amount of interest, if any, payable by a person of this category with effect from a prescribed date should be deemed to be wholly discharged.

In the case of small farmers owning unirrigated land more than one but up to two hectares, the debts would be scaled down in accordance with certain norms for which the repaying capacity of the debtor would need to be determined. After taking into account the consumption requirements and commitments for meeting farm investments and loans taken for production purposes and the present high cost of inputs, the Group felt that 40 percent, of the gross value of the agricultural produce of small farmers may be required for meeting his consumption needs, another 40 per cent. for meeting fresh commitments such as farm investments and repayment of production loans. Repayment of the scaled down debt would have to come from the remaining 20 percent of the gross value of the produce. The period of repayment of debts may be reckoned up to

7 years. The debts will, therefore, be scaled down to fit in with the above formula. There will be no recovery of amount in excess of the debt scaled down, and portion of the debt in excess shall be extinguished.

The interest payable on debts that are to be settled shall be calculated at the rate applicable to debt under the law, custom, or contract or at 6 percent per annum, whichever is less and credit shall be given for all sums paid or credited first towards outstanding interest, and the balance, if any, would be credited towards repayment of the principal. The principal and the interest outstanding thus calculated will be considered as the net outstanding debts on the prescribed date for the purpose of scaling down.

To avoid cumbersome procedures and eliminate all possible delays, it is suggested that jurisdiction of civil courts in respect of any settlement regarding scaling down of debts may be barred. To cut down delays, summary procedures may be adopted by the officers for this purpose.

For the proposed legislation, it has been suggested that a *landless labourer* be defined as "one who does not hold any agricultural land and whose principal means of livelihood is manual labour on agricultural land," a *marginal farmer* as "a farmer who owns land measuring not more than one hectare of unirrigated land and who cultivates personally such land and also a farmer who cultivates as a tenant or share cropper, land measuring not more than one hectare of unirrigated land." A *small farmer* may be defined "as a farmer who owns land measuring more than one but less than two hectares of unirrigated land and also a farmer who cultivates as a tenant or a sharecropper land measuring more than one but less than two hectares of unirrigated land." A *rural artisan* may be defined as "a person who does not have any agricultural land and whose principal means of livelihood is production or repair of traditional tools, implements and other articles or things used for agriculture or purposes ancillary thereto and also a person who normally earns his livelihood by practising a craft either by his own labour or by the labour of the members of his family in a rural area."

For the purpose of the proposed legislation, debt will not include certain liabilities such as any rent due in respect of any property let out to a debtor, any liability arising out of breach of trust on any tortious liability, any liability in respect of wages or remuneration due as salary or otherwise for service rendered; any liability in respect of maintenance and any due to the central government or any state government, any legal authority a banking company as defined in section 5 of the Banking Regulation Act, 1959, and including the State Bank of India, any subsidiary bank as defined in the State Bank of India Act, 1959, a corresponding new bank as defined in the Banking Companies (acquisition and transfer of under

takings) Act of 1970, a co-operative and mortgaged bank or other co-operative institution registered under the Co-operative Societies Act, the Agricultural Refinance Corporation or any other financial institution that may be notified by state governments. It will also not include any loan which represents the price of goods purchased by such a debtor.

Conclusion. The Sivaraman Committee (1976) has offered the following recommendation for the grant of consumption loans to effect the elimination of the institutions of moneylenders:

- (i) Grant of consumption loans for purposes like marriages, religious ceremonies, education and medical expenses, estimated at Rs 170 crores annually, should be given to the poorest of the rural population (i.e., the landless labourers, rural artisans and small farmers with holdings of less than half an acre). Such loans should be given by the co-operative banks and the Government.
- (ii) Grants of loans for similar purposes to marginal farmers holding half an acre to 5 acres of land, estimated at Rs. 125 crores annually, should be arranged by the co-operative and scheduled banks.
- (iii) In order to enable the poorer borrowers, to return these loans the States should work out schemes for their employment.

In sum it may be stated that the debt of the cultivating classes is but the symptom of a deeply rooted disease. The legislation may be regarded as of the nature of ambulance work, stopping the bleeding and the source of further infiltration of the disease, by applying antiseptics and bandaging without leaving untouched the roots of the disease. Legislation for scaling down the debt or restricting activities of the moneylenders will not cure the disease; nor will the fixation of a maximum rate of the interest, or a system of registration and compulsory keeping of accounts touch the roots: an effective co-operative movement reaching every village in its activities and backed by such financial resources as the total national assets of the country can provide, may be capable of solving the immediate problem.

In this connection, the observation of the Central Banking Committee deserves special mention. It stated, ".....a real and lasting solution can only be found by the spread of education, the extension of co-operative and joint stock banking and by the training of the borrower in habits of thrift and saving." *We may add that apart from making provision for cheap credit, the solution must be sought of the difficult problem of how agriculture can be made to pay by consolidation of holdings, by insurance of cattle against disease and deaths, by the establishment of subsidiary occupations, in short, by a many-sided and simultaneous attack on all the factors connected with the poverty of the rural masses.*

Agencies Supplying Rural Credit

RURAL MONEYLENDERS

Of all the agencies engaged in providing agricultural finance the *individual moneylender*, till recently, has been by far the most important both from the point of view of loans and the volume of business. There are two classes of moneylenders. One, the more common, is the *professional moneylender* who combines his business with trading in the village produce. The other *non-professional moneylender* is from the ranks of landowners and well-to-do agriculturists. Pledgers, pensioners, widows also usually lend money to those whom they know fairly well on good security which consists generally of land or ornaments. For about 45 per cent of the total borrowings, rural families had to depend on private agencies, 34 per cent on private and 12.7 per cent on professional moneylenders. "About 40 per cent was loaned at interest rates from 10 to 12 1/2 per cent ; about 20 per cent of loans at 18 to 25 per cent and nearly 7.5 per cent of the total amount at 25—35 per cent interest. A very high rate of interest ranging from 35 to 50 per cent was also charged by them for about 3.5 per cent of their total loans...Village moneylender is often the one thrifty person amongst generally thriftless people and that his methods of business suit the happy-go-lucky way of the peasants. He is always accessible, even at night, dispenses with troublesome formalities, asks no inconvenient questions, advances promptly and if the interest is paid, does not press for the payment of the principal. He keeps in close touch with his clients and in any village shares their occasions of weal and woe. With his intimate knowledge of those around him he is able, without serious risk to finance those who would otherwise get no loan at all. And he not only finances his neighbours, but frequently keeps small shop to supply their peasant needs and is nearly always prepared to market their produce; he is a dangerous necessity. It is the capital, constantly revolving in its own circle, which brings crop after crop to the threshing floor, and it is more than any one else who rides the peasant over a time of distress."¹

1. *Rural Credit Survey Report*, p. 597.

In the case of professional moneylenders it was found by the Rural Credit Survey Committee that "about 45 per cent of the borrowings of cultivators and 38 per cent of the borrowings of non-cultivators were from this agency ; about 47 per cent of the total debt of cultivators and about 45 per cent of the total debt of non-cultivators were owed to this agency. About 30 per cent of the money loaned by professional moneylenders was at interest rates varying from 10 to 18 per cent : about 34 per cent was loaned at 18 to 25 per cent; and 10 per cent at 25 to 35% and about 6 per cent at 35 to 50 per cent interest per annum. Borrowings from traders also point towards the same trend in interest rates. Advances at interest rates of 10 to 12 $\frac{1}{2}$ per cent amounted to 27 per cent of their total lendings : 13.3 per cent was loaned at 18 to 25 per cent interest : and 6.6 per cent was loaned at 25 to 35 per cent interest per annum."

Merits & Demerits of the Institution

The main advantages of this private agency are that : (i) the moneylenders have usually intimate knowledge of local production facilities, of the character of individual borrowers and of the value of assets that might be offered : (ii) They maintain the continual surveillance of individual families which is so often needed in poor rural localities. (iii) The costs of administration to the lender is low because they operate only locally and often without any paid staff. (iv) In granting loans, collecting interest and repayments, altering repayment arrangements or making renewals, they are comparatively prompt and less costly. In this connection the Rural Credit Survey Committee observed. "Perhaps most important of all and at the same time, illustrative of his adaptation to needs is his ability promptly to hand over the money, in order that some expenditure which brooks no delay may be helped to be met at once ; there is no need for him to await some one else's sanction ; and the compulsions... .. enable him, if he so chooses, to dispense with or postpone all or any of the legal formalities."

On the other hand, they suffer from certain disadvantages. (i) They cover only small areas and give loans only to few farmers. (ii) Being short of money themselves, they often charge high rates of interests. (iii) They may be anxious to maintain quite a high liquidity for one reason or the other and therefore, may advance loans for short periods only. (iv) They also secure a partial or even complete monopoly in the field.¹ This is a serious danger for farmers borrowing from them, because they may be reduced to the position of 'debt slaves' or even may lose their land. In this typical situation moneylenders not only enjoy an opportunity of amassing wealth, mainly through the snowballing of compound interest charges, but also get innumerable pecuniary benefits by acquiring a thorough grip over the peasant life.²

1. F. A. O., *Agricultural Credit for Smaller Farmers*, 1952, p. 11.

2. U. N. O., *Rural Progress Through Co-operatives*, 1954, p. 39.

Malpractices followed by Moneylenders

As Mr. Strickland says, "the chief evil in a money-lender's credit is not the high rate of interest or the falsification of the books which is practised by a minority of the class, but the fact that he grants loans for unproductive as well as productive objects and in excess of borrowers' means and does not insist on the prompt payment on a good harvest. His ambition naturally is to see his money well invested and to live on the interest."

The money-lenders often resorted to certain highly objectionable practices. The most common practices of this nature are :¹

(1) At the time of advancing money, the money-lender deducts in advance the total interest for the year from the principal but makes the borrower sign a bond to the effect that the full amount has been received. As no receipt is given for the interest deducted in advance, the moneylender can easily demand payment of the interest after a year.

(2) Moneylenders get the thumb-impression or signature of the borrower on blank sheets of paper before lending money and later on enter more than the actual amount if the debtor is not regular in the payment of interest.

(3) It is a common practice for the moneylenders to manipulate the figures in their registers in such a way as to show a larger amount than is actually lent.

(4) Whenever the borrower is illiterate the sum inserted in written documents is very often shown to be larger than what is actually lent.

(6) Debtors have to pay something to the moneylenders as a present called *girah khulai* (purse opening) before any business is transacted. Other charges like *gaddi kharcha*, *salami katauti*, *battawan*, etc. are also charged by the moneylender.

(7) Conditional sale deeds are taken by moneylenders to ensure against the possible evasion of payment by the debtor.

One of the great abuses of the private moneylenders has been the exorbitant rates of interest. "The proportion to the total borrowings of cultivators from private credit agencies of such of those borrowings as bear a rate of interest of 25 per cent or more is as high as 70 per cent in Orissa, 49 per cent in Tripura, 40 per cent in West Bengal and H. P., 29 per cent in U. P. and 27 per cent in Bihar. Nor are annual interest rates of 50 per cent or above infrequent in certain areas."² This has been due to a number of factors, viz., an absence of any effective alternative source of credit,

1. Report of the Central Banking Enquiry Committee, p. 77 ; Rural Credit Survey Committee, Vol. II, pp. 174-175.
2. Report of the All India Rural Credit Survey, p. 63.

greater risks that agricultural credit entails, small size of farm holdings, the absence in many cases of ownership or occupancy rights in land, scattered nature of units of maintaining contact between the town and remote country areas supplying credit to agriculture tends to become more difficult and costly in other fields.¹ However, the high rates of interest is hardly justified by economic considerations. "Cumulative effect of exorbitant rates of interest paid by cultivators, low prices received from the sale of agricultural commodities and the effect of various malpractices of moneylenders who are also dealers in agricultural produce is that debt once contracted keeps on accumulating."²

Suggestions for Improvement

In order to reform the money-lender and his ways of business, the *Agricultural Finance sub-Committee* recommended the following measures.³

(1) Registration and licensing of moneylenders, (2) maintenance of accounts in prescribed form ; (3) prohibition against showing in books of accounts or in any other document a sum larger than what has been actually lent ; (4) furnishing of periodical statement of accounts to the debtors ; (5) furnishing of statement to the debtors in prescribed form giving full particulars about each such loans as and when advanced ; (6) issue of receipts to the debtors for every payment received ; (7) limitation of rate of interest ; (8) the enforcement of the rule of *Damdupat* ; (9) prohibition against taking unlawful charges for expenses ; (10) provision to entitle the debtor to deposit at any time in a Court of law an amount in part or full payment of a loan to be paid to his creditors ; (11) prohibition of contract for payment of loan outside the state ; (12) institution of suits by the debtors for taking account and for having amounts due from them determined. (13) protection of debtors from molestation and intimidation ; (14) infringement of the provisions of law to be made a criminal offence punishable with fine and in appropriate cases with imprisonment. (15) the definition of moneylender should be more comprehensive so as to include all loans bearing interest : (16) a State inspecting and supervising agency (similar to one functioning under the Small Loan Legislation in U.S. A.) should be set up in each state. It should carry out periodical and surprise inspection of books of moneylenders. Every money-lender should be required to submit to the agency annual returns regarding his business. The agency should publish periodical reviews of the effects and working of Debt Acts. Institutional credit should be developed for this purpose ; and marketing should be regulated by law and licensed warehouses should be established and receipts made negotiable.

1. U. N. O., *Progress in Land Reforms*, p. 212.

2. F. A. O., *Credit Problems of Small Farmers in Asia and The Far East*, 1957, p. 12.

3. *Agricultural Finance Sub-Committee Report*, 1945, p. 67.

In view of these recommendations, the Government of India took steps to regulate the activities and operations of moneylenders through legislative enactments. The basic objectives of such enactments are : (i) To bring about an improvement in the terms on which private credit was available to agriculturists and to place legal restrictions on the unreasonable exactions of moneylenders. (ii) To enable civil courts to do greater justice as between the lenders and borrowers than was possible in the prevailing circumstances.

However, such legislations did not bring about any material improvement in the terms on which private credit is available to the farmers. The R.C.S. Committee has concluded that "control sought to be exercised through legislation has had little effect on moneylender or his operations beyond putting him to necessity of devising a variety of legal camouflage for a whole range of legality.¹

Even today, moneylenders or sahu-kars are the mainstay of Indian farmer. This is certainly not a very healthy feature. Observes Dr. Darling "properly organised systems of land credit must ultimately drive the moneylender from his last stronghold. There are few relationships so injurious to both parties as that of moneylender and borrowers. In India it is almost invariably demoralising.²

What we need in this respect is to set up or reorganise institutions for canalising rural and institutional saving with a view to providing induced investment or *capital* in agriculture.

Institutional Finaucing

Out of the total direct institutional finance of Rs. 2029 crores disbursed in 1977, co-operatives accounted for about Rs. 1367 crores or 67.4 per cent of the total. Loans issued by the scheduled commercial banks estimated at Rs. 565.0 crores represented for 27.8 per cent of the total direct institutional credit for agriculture. The Government loan amounted to Rs. 85.5 per cent. Of the total direct loans, Rs. 1728.4 crores were for short term and Rs. 600.3 crores for term-loans.

The following table shows the direct Institutional finance for agriculture :³

-
1. *Report*, Vol. II, p. 361.
 2. M. L. Darling, *Co-operation in Germany & Italy*, p. 103.
 3. *Report on Currency & Finance*, Vol. I, 1976-77, p. 130.

Source	1973	1974	1975	1976	1977
1. Co-operatives of which	975.9	876.7	1040.0	1186.7	1366.6
(a) Short-term	612.8	663.1	750.9	881.4	1016.3
(b) Term-loans	345.1	213.6	289.1	305.3	350.3
2. Government (Short-term)	176.8	90.8	77.5	81.5	85.5
3. Scheduled Commercial Banks of which	20.9	219.2	275.3	404.9	565.0
(a) Short-term	N.A.	105.4	146.1	212.5	315.0
(b) Term-loans	20.9	113.8	128.2	192.4	250.0
4. Regional Rural Banks (Short-term)	—	—	—	1.5	11.2
Total of which :	1156.6	1186.7	1391.8	1674.6	2028.7
(a) Short-term	789.6	859.3	974.5	1176.9	1428.4
(b) Term-loans	366.0	327.4	417.3	497.7	600.3

CO-OPERATIVE CREDIT SOCIETIES

The rural credit societies were started to carry on the business of the rural banking and replace the moneylenders, yet they have not made any appreciable progress. The record of the performance of the co-operative credit has been very uneven as between different states. Even in the States, which have registered considerable progress, there are pockets where the performance of co-operatives has been very poor and weak.

It has been estimated that at the end of 1976-77 1.23 lakh primary agricultural credit societies with a membership of 41.5 million covered over 97 per cent of the villages, 47 per cent of the rural population and 48 per cent of the agricultural families. Co-operatives supplied 3.3 per cent of the total credit in 1951-52. Since then the proportion has increased to 15.5 per cent in 1961-62 and to 33 per cent in 1969-70. The co-operatives advanced Rs. 815 crores during 1976-77 as medium and short term loans.

The following table shows the quantitative development of different aspects of the primary agricultural societies in India.

Progress of Co-operative Credit in India

Year	No. of Coops- (lakhs)	Member- ship (lakhs)	% of Agr. Pop. covered	Short & Medium term loans Advanced (In crores of Rupees)	Long term Loans advanced	Total credit Ad- vanced
1950-51	1.05	44.08	9	22.9	1.38	24.28
1955-56	1.60	77.91	15	49.6	2.86	52.46
1960-61	2.12	170.41	30	202.75	11.61	214.46
1965-66	1.92	261.35	40	341.75	57.96	379.71
1966-67	1.79	267.09	41	366.47	57.55	424.02
1967-68	1.75	280.74	42	404.58	84.74	489.32
1968-69	1.68	330.00	43	503.97	148.16	652.13
1969-70	1.65	297.65	43	526.74	155.86	682.60
1971-72	1.57	320.09	41	614.53	154.44	768.47
1972-73	1.55	335.28	41	774.89	181.78	956.67
1973-74	1.54	349.56	42	815.20	181.47	996.67
1974-75	1.53		41	750.9	289.1	900.82
1975-76	1.35		45	881.4	305.5	1,023.45
1976-77	1.23		47	1,086.3	350.3	1,153.35

Merits And Demerits of Co-operative Credit Societies

Co-operatives enjoy many advantages such as : (i) these societies possess intimate knowledge of the character and abilities of their members, and of local production possibilities : (ii) small co-operatives can instil in its members strong feeling of responsibility for prompt payment of interest and repayment of loans, and can also provide strong incentives to thrift and savings. (iii) The procedure of deposit and withdrawal is far less complicated, since identification and similar problems do not exist ; the official to be approached belong to the same village as the members and work in the same trade ; and the fact that money accumulated through savings is generally to be spent within the village centres that additional sense of confidence needed to encourage villagers to practise the habit of banking.¹ (iv) Further, "as a means of reaching the last man in the last village, co-operative credit has no rival except the moneylender, it offers the only possible method of proved merit for reaching the people as a whole. It is the only practical alternative to usury."²

However, there is a considerable unevenness in the development of co-operative credit. Credit societies have hardly met even the urgent need of the tenant cultivators small and marginal farmers and landless labour, who are deeply indebted to the moneylenders and who are without securities to pledge and unable to accumulate

1. I. L. O., *Co-operation As a Means of Mobilising Small Savings*.
2. H. Calvert, *Co-operation in the Colonies*, 1945, p. 31.

adequate savings to repay the loans would be the correct estimation of situation in India and South-East Asia.¹

According to the Co-operative Planning Committee, the main causes of limited progress are : "the *laissez faire* policy of the State, the illiteracy of the people, and the fact the movement did not take the life of the individual as a whole... among the other causes, the small size of the primary unit and undue reliance on honorary services for even day-to-day work with resultant inefficiency in managements."² According to the Rural Credit Survey the chief causes of failures may be summed up thus : "functional, structural and administrative defects, dearth of suitable personnel, lack of training, a background of illiteracy, the grave and chronic deficiency in roads, storage and other vital economic requirements—all these are relevant as part of the explanation." The more fundamental of these causes of failure of the cooperative movement is the competition, virtually opposition, which the co-operative credit and other types of societies have to face from the relatively powerful private agencies. Therefore, it was not surprising to find the co-operative societies taking the line of least resistance, by giving loans to those who had substantial property. "Cooperation in India was a plant held in position with both hands by Government since its roots refuse to enter the soil." The cooperatives supply only 35.0 per cent of the total credit requirements. Out of this little, the large part goes to the bigger agriculturists and only a minor fraction percolates to the smaller cultivator. This is evidenced by the fact that the land held by the small cultivators of 2 hectares and lesser size accounted for 75 per cent of the total holdings and 20 per cent of the total cropped areas, but, despite their heavy need, they received only 35 per cent of the short-medium-term loans advanced by primary societies. Most co-operative societies lent on the security of lands, and tend to set aside as 'non-creditworthy' those who could not offer such security. Other reasons for failure of co-operative credit were inadequacy of funds and staff, dearth of sound and reliable workers want of confidence in the movement, definite nature of agriculture and illiteracy among cultivators.

Suggestions for Improvement

The Rural Credit Survey Committee has said that, 'co-operation has failed,' but they emphatically also added that "co-operation must succeed." This committee recommended among other things : (1) State participation in the share capital of co-operatives and the nationalisation of Imperial Bank. (2) Strengthening of the co-operative credit structure at all levels ; (3) Linking up of credit with marketing ; (4) Development of processing on co-operative lines. (5) Promotion of storage and warehousing ; (6) Improvement

1. E. M. Hough, *Co-operative Movement in India*, 1950, pp. 284-285.

2. *Report of the Co-operative Planning Committee*, 1946.

of training facilities and the strengthening of supervising and administrative machinery.

The Committee on Co-operative Credit (1963) recommended that :

- (a) As a general rule, co-operative should be organised on the basis of the village community as the primary unit. Where villages are too small, the number of villages to be covered by a society may be increased in the interest of viability. The extension, however, is subject to the maximum limits of a population of 3,000 and a distance of not more than 3 to 4 miles from the headquarters village. The aim should be to ensure viability with the inclusion of the smallest number of villages.
- (b) The State may participate in the share capital of primary agricultural credit societies under certain conditions ; the maximum contribution being ordinarily limited to Rs. 5,000 and in exceptional circumstances to Rs. 10,000.
- (c) Co-operative societies should admit to their membership all classes of cultivators including marginal and sub-marginal cultivators, landless tenants etc., [and provide them adequate credit on the basis of their production requirements and repaying capacity.
- (d) All short and medium-term loans up to Rs. 500 should be given without mortgage of landed property.

From the beginning of the Third Five Year Plan, the State Governments have been actively implementing a policy of revitalisation and reorganisation of primary co-operative societies to form viable units through the process of amalgamation, extension of area of operation and liquidation. As a result of this policy, the total number of primary credit societies in the country came down to 1.71 lakhs in 1967-68 and further to 1.23 lakhs in 1976-77, from 2.15 lakhs in 1961-62. The total number of viable societies to be retained by the end of the Fifth Five Year Plan was visualised as 1.15 lakh.

The co-operative structure occupies a pre-eminent position in the institutional frame work of agricultural credit. The major emphasis in the Plans has been on the strengthening of co-operative credit in regard to structure, mobilization of resources, and operational efficiency. In recent years the technological breakthrough in agricultural production has been making very large demands as the co-operative credit institutions for current finance and investment capital. The loaning policies and procedures are, therefore, being realigned to serve the small farmers more effectively. This new approach to co-operative credit envisages that : (i) the main criterion for providing loan to farmers will be production potential through the adoption of the crop loan system and not the value of security a farmer

offers for loan : (ii) needs of small cultivators are to be met adequately on priority basis when resources are inadequate to meet requirements of all ; (iii) a relatively higher proportion of their borrowing will be contributed by the larger cultivators towards share capital.

Many State Governments are considering important legislative measures such as exclusion of money lenders from becoming members of the cooperatives, reservation of seats on their board of management for weaker sections ; restrictions on holding offices simultaneously in a number of institutions, regulation of loans to office bearers and regular elections by an independent authority.

LAND DEVELOPMENT BANKS

These banks supply long term credit to the cultivator. The need for these banks arises because : (i) the primary co-operative societies cannot possibly give loans to the cultivators for long periods as they themselves draw their funds from the Central Co-operative Banks for short and medium terms ; (ii) the work of making long period loans on the basis of landed property requires expert assistance for valuation, title deed, which the primary co-operative societies do not possess. These banks can work satisfactorily if they are assisted by the State Government in the provision of requisite staff for managerial and evaluation work.

These banks have a two-tier structure with central land development banks at the state level and primary land development banks at the tehsil/sub-divisional/district level. These banks registered commendable progress in recent years—the quantum of loans advanced to individuals by the banks have risen to over Rs. 242.31 crores in 1976-77 from Rs. 129 crores during 1968-69, Rs. 3.81 crores in 1951-52 and Rs. 27.34 crores in 1961-62. Loans outstanding with individuals amounted to Rs. 37.74 crores in 1960-61 ; Rs. 166.41 crores in 1965-66 ; Rs. 402.17 crores in 1968-69 and Rs. 1117.52 crores in 1976-77. There were 20 central and 893 Primary Land Development Banks in 1976-77.

GOVERNMENT AND RURAL CREDIT

The Government both at the Centre and in the States, provides finance indirectly as well as directly.

(i) **Indirect Financing.** Indirect credit is provided through the co-operative societies. Government assistance to the co-operative credit has been mainly in the following directions :¹

- (a) Taking shares in co-operative credit institutions to give them prestige and to enhance their borrowing capacity. Such participation is 'retirable' after the end of a parti-

1. K. Madhava Das, "Government Financing in India." *Agricultural Co-operative Credit in South-East Asia*, 1967, pp. 174-75.

cular period in respect of primary cooperative credit societies and is met out of loans from the R. B. I. under its Long Term Operations Fund Scheme.

- (b) Providing guarantees to the relatively weak apex banks to enable them to borrow from R. B. I.
- (c) Providing subsidies to co-operative societies to enable them to employ trained and full time managers/secretaries. Loans and subsidies are also given to primary credit societies to construct small warehouses required for their marketing functions. Subsidies have also been given to co-operative banks for opening branches and for employing supervisory staff.
- (d) Contributing to special bad debt reserve funds of primary co-operative credit societies and banks to help them finance the weaker sections of the membership.
- (e) Providing grants in special cases to stabilize the position of co-operative banks which have become weak owing to abnormal reasons.
- (f) Some of the State Governments have set up Agricultural Credit Relief and Guarantee Funds for giving assistance to co-operatives whose position is made vulnerable by irrecoverable arrears of debts which have arisen from causes beyond their control.
- (g) Subsidies to enable co-operative banks to meet the difference between their economic lending rate and the rate at which funds are to be provided under certain Government schemes.
- (h) Guaranteeing the debentures issued by co-operative central land mortgage banks and giving them interim accommodation to such banks pending floatation of their debentures.

All this is intended to strengthen the co-operative credit structure so that in course of time, it becomes self-reliant. *Secondly*, this assistance does not imply Government interference with the day-to-day working of the co-operatives. *Thirdly*, the Government representation on the board of the banks and the societies is generally limited to 1/3rd of the board or 3 Government nominees, whichever is less. Thus Government is playing a complimentary role to the R. B. I. in the development of co-operative credit.

(ii) **Direct Financing.** The Government has also been financing farmers directly. Agricultural credit from the Government is called *taccavi* and has a long history in India. It is provided under the Land Improvement Loans Act of 1883 and the Agriculturists Loans Act of 1884. The former Acts deal with long term loans and the latter with short-term loans.

- (a) The Act of 1883 authorises the grant of long-term loans by local officers for permanent improvements on land, which add to its letting value such as construction of wells or erecting of embankments, the preparation of lands for irrigation, protection of lands from flood or from erosion. Such loans are generally advanced for periods extending over 25 years on the security of landed property, at a rate of 6 to 10 per cent. The loan is repayable by equal annual instalments discharging by principal and the interest.
- (b) Whereas under the Act of 1884 short-term and intermediate term loans granted for current agricultural needs such as the purchase of houses destroyed by flood. Such loans are repayable after the harvest.

The direct institutional finance providing by the Government was of the order of Rs. 176.8 crores on June 30, 1973. It was Rs. 90.8 crores ; Rs 77.5 crores ; Rs 81.5 crores and Rs. 85.5 crores for the period ending June 30, 1974, 1975, 1976 and 1977 respectively.

These loans were formerly provided through the agency of Community Development and the Revenue and agricultural Departments of the States. Now they are to be routed through the co-operatives. These may also be given through land development banks, where they are strong as in Tamil Nadu, Andhra Pradesh, Karnataka Maharashtra, and Gujarat.

Merits and Demerits of Government Loans

The advantages of *taccavi* loans lie in their long-term and low rates of interest. But the total amount lent under both the Acts is extremely insignificant and amounts to mere drop in the ocean. These loans play a very small part in agricultural financing. In this connection the Rural Credit Survey Report remarks, "The record of *taccavi* is a record of inadequacies." The different aspects of this problem are :¹

- (1) Inadequacy of amount, inequality of distribution and inappropriateness of security ;
- (2) Inconvenience of timing, incidental delays and impositions of various kinds on borrowers ; and
- (3) Inefficiency of supervision and incompleteness of co-ordination.

The levy of illegal gratification by the village *patwari* and the B. D. Os. coupled with extremely rigid conditions set by the Government, inelasticity and inefficient administration have rendered these loans very unpopular. Further, Government loans like co-operative loans are found on investigation to gravitate to the big and large land-holders in preference to the medium or small farmers because

1. Report, Vol, 11, p. 199.

strict adherence is insisted upon collateral security. Thus, the system of *taccavi* as conceived and administered by the Govt. is not a system of finance but one of casual advance.¹ Apart from these defects, the more important shortcoming is that little attempt was made to follow up the loan with proper supervision as to its utilization for productive purposes.

Taccavi loans are given to the farmers at a low rate of interest and mostly unrelated to production efforts and as such have spoilt the credit markets.

However, such loans have declined particularly on account of the difficulties in finding budgetary resources for the purpose and also due to a feeling that the government is not properly equipped to function as a lender.

The Rural Credit Survey Report expressed dissatisfaction with the disjointed working of *taccavi* loans. In practice such loans are to be little else than the ill-performed disbursement of inadequate money by an ill-suited agency and suggested that it should be strictly limited to relief of distress.² Even the Rural Credit Review Committee (1969) is not in favour of government granting loans. According to this Committee, "the drawbacks of the system are that the disbursements are dilatory, there is lack of supervision and poor recovery, etc." This bureaucratic line of credit can hardly be expected to be operated with the degree of judgement, flexibility and responsiveness so very necessary for agricultural credit needs. Ultimately *taccavi*, as it is called, should not be provided except to meet widespread situations of droughts and floods though, in the transitional period, it may continue in the present form. In 1978-79, the upper limit of *taccavi* has been placed at Rs. 100 crores.

Suggestions for Improvement

(1) In order to make the loans cheaper the Government has suggested that a mild rate of interest should be charged in respect of all loans given by the co-operatives and such a rate should not be unduly high. Generally it should be below 8%.

(2) If *taccavi* loans are to be of any use to cultivators it is necessary that the administration of such loans should be made less rigid and the delay in granting of loans and the unfairness in the realisation of joint bonds should be remedied.

(3) The facilities for borrowing from the Government and the conditions under which loans are advanced should be made more widely known to the public than at present.

(4) The loans can be made useful to popularise agricultural improvements and in mitigating the difficulties of famines by making

1. S. N. Ghosal, *Agricultural Financing in India*, 1966, p. 35.

2. R. C. S. Committee's General Report, p. 199.

these loans freely available in backward tracts where co-operative credit societies cannot be successful.

(5) Increasing provision should be made by the State Governments for the grant of *taccavi* loans and such provision should be utilised : (a) for providing medium term resources to co-operative banks in the shape of loans, (b) for the purchase of debentures of land mortgage bank so that they may be in a position to finance all long-term projects for agricultural production; (c) for providing subsidies to cultivators who take loans from co-operatives for sinking of wells; (d) for reducing the rate of interest charged by co-operatives on long and medium term loans and bringing them at par with the rate of interest charged by government on *taccavi* loans.

Such loans should be routed only through co-operatives.

The Committee appointed by the Central Government to consider various organisational, procedural and administrative difficulties that might come in the way of successfully carrying out this policy and to make suitable recommendations stated that there was considerable duplication in financing agriculturists under the prevailing system of Government loans and the system of co-operative credit to agriculturists. It said, "To increase agricultural production concerted efforts would have to be made first, to make available to the agriculturists larger amounts to match their requirements and, secondly, to ensure that the optimum advantage was derived from such funds as were available." Towards this end, "it is essential to define more clearly the respective roles and to rationalize the operations of *taccavi* loans and co-operative credit."¹

Co-ordination between Government and co-operative loans for agriculture may be achieved in the following ways :

- (i) Government loans should be made available to co-operative banks at interest rates which should enable the banks to keep adequate margins between these rates and the rate at which they lend to their affiliated primary credit societies.
- (ii) Before a decision is taken by the Government to provide finance not directly but through co-operatives the question whether the co-operative credit structure is able to undertake this responsibility should be carefully examined, because a weak co-operative credit structure will find itself in a further mess if it takes itself this additional function.
- (iii) Government should provide loans timely to co-operatives, i.e. these should be provided from February to May.

1. Report of the Committee on *Taccavi Loans and Co-operative Credit*, 1962, p. 83,

- (iv) Government financing should strengthen and not weaken the discipline of the co-operative credit structure. In a federal co-operative structure Government loans should be provided through the Apex Banks and not through the Central Banks or local societies.
- (v) The terms and conditions of Government loans should be specific and clear and should be carefully considered by the co-operative banks before acceptance. Further, in the selection of areas where the policy of distributing Government loans through co-operative is to be implemented, the co-operative apex financing agencies should be consulted. It is also most important to ensure that full freedom is given to co-operative banks and societies in dealing with individual loan applications.
- (vi) The Government might decide to disburse distress agricultural loans through the co-operatives. In such cases the co-operatives should examine carefully all implications connected therewith. If the co-operatives fully agree to implement such a scheme it would be preferable to do this on an agency basis not involving any financing liability to the co-operative banks and societies. This is essential in view of the special risks involved in repayment of distress loans.

In brief, Government financing of agricultural co-operative credit movement should be done in such a manner as to strengthen it and build up its internal cohesion and discipline. These banks do not consider agricultural finance as part of their ordinary business because they are not organized to supply rural long-term credit or short-term credit needs. They, however, indirectly finance agriculture to a greater extent through merchants and dealers. This indirect financing on account of intermediaries is very dear. Such financing is done by financing loan to merchants and commission agents on the security of agricultural produce stored in the places approved by them at 6 or 9 per cent in the movement of produce from mandis to the consuming centres to the parts. Stocks so pledged have to be insured against fire and the bank may also require insurance against additional risks such as floods; they are usually kept under the bank's lock and key and are subject to periodical inspection by the bank's officials. These stringent conditions coupled with the fact that in most large centres there are indigenous bankers from whom credit can be obtained at lower rates make the merchants under ordinary circumstances, extremely unwilling to approach the banks for credit.

COMMERCIAL BANKS

The Commercial banks did not form an important source of agricultural credit. These banks mainly cater to the needs of the

urban centres at the cost of credit hungry agricultural sector. Between 1956-1965, scheduled banks opened only 196 branches in the unbanked areas. In 1968, they opened 674 new offices.

The share of banks in the total borrowings of agriculturists was hardly one per cent in 1951-52. This proportion did not increase substantially during the 10 years as was revealed by 1961-62 survey. It was only 5.3 per cent.

Since 19th July 1969, after the nationalisation of 14 banks, commercial banks have opened their branches in rural areas and expanded their value of credit to agriculture. Between 1969 and 1978, of the total 28,016 new bank offices opened by these banks, 11,802 offices, i. e. about 42.1 were located in rural areas. The credit advanced increased from Rs. 188 crores in 1969-70 (5.2% of aggregate bank credit) to Rs. 767 crores (8.9% of the aggregate bank credit) in 1977-78. They have also now been financing the primary credit societies.

The commercial banks also financed agriculture through primary credit societies in 10 states. They disbursed short-term loans aggregating Rs. 315.0 crores and medium term loans of Rs. 251.4 crores upto the end of June 1977. The outstanding amount of these banks were of the order of Rs 450 crores and Rs 1137 crores respectively.

These banks also started the scheme of financing farmers, through Farmers' Service Societies in a few selected SFD/MFAL areas for providing short, medium and long term loans to their members and also supply inputs, arrange for marketing of produce. 15 such societies have been organised till the end of June 1977.

The following table shows the percentage share of bank credit of selected sectors of the economy :

Sector-wise Distribution of the Commercial Bank Credit.

Sector	March 1951	March 1956	March 1961	March 1966	June 1972	June 1974	June 1975
1. Industry	33.5	37.2	50.8	62.7	57.6	56.9	56.5
2. Commerce	53.1	45.8	33.8	24.7	17.4	17.5	16.5
3. Financial	7.3	6.6	6.7	4.6	10.0	10.3	9.6
4. Agriculture (Including Plantations)	2.1	2.0	3.1	2.4	6.8	8.9	0.8
5. Others	4.0	8.4	5.6	5.6	18.2	7.4	6.6

These banks distributed Rs. 565 crores as direct finance during the period ending June 30, 1977.

Commercial banks have faced great difficulty in providing agricultural credit, specially for these reasons :

First, credit requirements of Indian agriculture has been mounting up year after year. Such increasing requirements could not be fulfilled by these banks because of lack of refinancing facilities.

Second, the basic weakness of our agriculture continues to persist and they put very serious limitations on the expansion of the institutional credit, commercial or co-operative. The bulk of the farmers being small, their ability to use borrowed funds for productive purposes is very limited.

Third, the poor performance of repayment of loans is extremely poor usually between 20—30% of the borrowings. This creates a risk in financing the needs of small cultivators.

Fourth, the absence of proper account-books, remoteness of farms, difficulties in knowing the integrity and trustworthiness of the farmers, hardships in maintaining close contacts and absence of concrete policy (till recently) laying down the guide-lines for the commercial banks have added to the unwillingness of these banks to provide agricultural finance.

Fifthly, no guarantee facilities were provided to these banks in case of rural advances to small-scale industrialists.

Sixthly, seasonal vicissitudes and uneconomic nature of the farming industry, illiteracy among farmers, the imperative necessity of keeping their funds liquid also prevent these banks from advancing credit to the farmers.

Finally, there are precarious forms of security inasmuch as their value might depreciate on account of factors over which farmers have no control.

The nationalisation aimed at rectifying the existing functional deficiencies and operational changes in the structure of commercial banks. The commercial banks have taken suitable measures individually and collectively to provide agricultural credit. The 37 commercial banks set up an Agricultural Finance Corporation with an authorised capital of Rs 100 crores. The objectives of the Corporation are : (1) to provide medium and short term credit for seed farms, (2) to provide medium term loans for mechanisation, (3) to finance vertical integration of processing industries with agricultural production, (4) to finance construction of warehouses, godowns, silage and running of storage industries, (5) to finance transport of agricultural produce, (6) to finance regulated market construction, (7) to finance building up subsidiary food industries through development of poultry and fisheries, (8) to provide short-term loans through intermediaries like fertilizer companies, (9) to finance medium term loans for pumping sets for lift irrigation ; (10) to provide loans to build up services to the farmer, and (11) to provide loans for extensive spraying operations and financing pesticide companies.

Thus the Corporation is entrusted with two major functions, *viz.*, to promote commercial banks' advances for agricultural development and to finance individual institutions and organisations of undertaking agricultural operations.

The Corporation approved, since its inception, 62 schemes involving net commitments of Rs. 204.1 crores. Total disbursements upto June 1977 aggregated Rs 92.2 crores. During 1977-78, the A. F. C. undertook formulation of four Command Area Development Projects, one comprehensive Area Development Project, one credit Plan for D. P. A. P. Project, 5 Integrated Tribal Area Development Projects, project for Integrated Horticultural Produce Processing and Marketing.

The entry of commercial banks has shown some new approaches :

(i) Integrated or project approach to agricultural credit in the sense that short-term, medium-term and long-term credit requirements are treated as a total package. This has indicated the need for co-ordination between short-term and long-term co-operative banking structure as well.

(ii) Possibilities of streamlining procedures for the supply of credit. Here the need has particularly been for the improvement of land records so as to remove the difficulties faced by the banking agency.

(iii) The standards of viability and non-viability of the farmers have been changed. Consequent upon the introduction of improved seed and technology even the small farmer has been able to utilize new technology to raise his repaying capacity and thus became a viable farmer.

The traditional role of the commercial banks was a "purveyor of credit", but now, they act as "catalytic agents" in the nation's economic progress.

The commercial banks are to supplement their role as the emancipator of the farmers from the money-lenders, alongwith the co-operatives. Both these sectors can perform their work to achieve one and the same aim and there is less possibility for any type of conflict. *Firstly*, the credit requirements of agricultural development during the coming years is so vast that even the combined resources of both the co-operative and commercial banks may not be adequate to meet it. *Secondly*, the element of competition with the commercial banks should tone up and revitalise the co-operative system itself.

The co-operatives have the experience of agricultural credit and direct contacts with the farming community while the commercial banks have the traditional business efficiency and management

expertise. Each sector should collaborate and benefit by the experience and expertise of the other.

Suggestions for Improvement

The commercial banks can increase their lending to agriculture in three ways : (a) by increasing the rate of deposit mobilization, especially from the rural sector which at present contribute hardly 0.2 per cent to the total deposits ; (b) by diverting a part of the funds already lent out to the industrial sector and the agricultural sector ; and (c) by borrowing additional funds from the Reserve Bank at concessional rates just like the co-operatives. Of these three alternatives, the second should be the last resort, since it will have an adverse impact on other sectors of the economy

The commercial banks can also play an important role in the field of marketing finance. The volume of finance supplied by commercial banks to agriculturists for the purposes of marketing could be considerably increased by improving the arrangement for marketing of crops by : (a) the grading and standardisation of staples and of contracts, (b) proper storage facilities and (c) the creation of properly regulated local as well as forward markets. The regulation of marketing by special enactments providing for the licensing of brokers, regulating the conditions of their business, prohibitions of illegal deductions, use of standard weights and measures, regularising market prices, maintenance of regular accounts of all transactions and giving of receipts to the sellers, publication of market information, etc., will ensure proper marketing, reduce fluctuation of prices and marketing risks. These reforms will not only reduce the cost of marketing to the grower and ensure him a fair price but will also encourage commercial banks to take greater part in financing the sale of agricultural produce.

Many State Governments are considering important legislative measures such as exclusion of money lenders from becoming members of the cooperatives, reservation of seats on their board of management for weaker sections ; restrictions on holding offices simultaneously in a number of institutions, regulation of loans to office bearers, and regular elections by an independent authority.

The Expert Group on Credit Schemes of Commercial Banks

The Expert Group, constituted by the R. B. I. in August 1977, under the chairmanship of Dr. Gunvant M. Desai, to study the agricultural credit schemes of commercial banks, has pointed out a number of shortcomings in the modalities of formulation, content and implementation of agricultural credit schemes, which might seriously hamper the objectives and defeat the very purpose of achieving the end results. The Group Report has emphasised the importance of diversifying the purpose for which credit schemes are being formulated by extending the range of activities covered and

developing credit schemes for unconventional purposes. It has made the following recommendations :

- (i) Proper supervision of credit ensuring that loans are not misutilised and at the same time, the functioning of other activities are taken care of on which the viability of the scheme may depend upon ultimately.
- (ii) Creation of a task force comprising the representatives of the respective Lead Bank, state government and other connected agencies to facilitate the implementation of credit schemes at the district level.
- (iii) Formulation of a continuous monitoring and evolution system of credit schemes by commercial banks so as to take up timely corrective action.
- (iv) Credit schemes designed to suit exclusively different categories of weaker sections and low income groups like small and marginal farmers, landless labourers, tenant cultivators, share croppers, etc., leading to an over-all development of the economy of adopted villages by commercial bank.
- (v) Besides, underlining the functional linkages between activities financed, the Group has made suggestions for the minimising of procedural difficulties and delays in sanctioning loans, especially, in cases related to individual borrowers, even by passing of legislation to this effect, if need be.

STATE BANK OF INDIA AND RURAL CREDIT

On the recommendations of the Rural Credit Survey Committee, the Imperial Bank of India was nationalised and was replaced by the State Bank of India on July 1, 1955.

The Committee observed : "The creation of one strong, integrated, State-sponsored, State-partnered commercial banking institution with an effective machinery of branches spread over the whole country, which, by further expansion (including minor amalgamation where necessary) can be put in a position to take over cash work from non-banking treasuries and sub-treasuries ; provide vastly extended remittance facilities for co-operative and other banks, thus stimulating the further establishment of such banks, and generally, in their loan operations, in so far as they have a bearing on rural credit, follow a policy which while not deviating from the canons of sound business, will be effective in consonance with national policies as expressed through the Central Government and the Reserve Bank."

In regard to the financing of co-operatives the Committee specifically recommended that "the State Bank of India should be responsive to the needs of co-operative institutions connected with

credit, and particularly marketing and processing societies. Further, it was observed by them that the branch extension should be co-ordinated ; and wherever possible positively associated with the development of the co-operative credit, from the point of view specially of the provision of cheap remittance facilities."

The *ad hoc* Committee appointed by the Reserve Bank in 1957 to formulate a programme of action for the State Bank of India concluded that in meeting the credit requirements of marketing and processing co-operatives (which would be of a substantial order) : the Bank should make a significant contribution in respect of rural finance, specially in States where co-operative banks were relatively weak. The Committee did not agree either to the State Bank's taking over the function of the Reserve Bank in the sphere of agricultural credit or the Bank substituting for the State Co-operative Bank or the Central Co-operative Bank or both.

The Informal Group on Institutional Arrangements for Agricultural credit, constituted by the Reserve Bank (1964) remarked that the Bank's records in the matter of supporting non-credit co-operative activity connected with agriculture had been quite encouraging. They suggested that the State Bank should finance the rural and co-operative sector by granting working capital advances for food grains procurement operations and extension and expansion of credit facilities to various types of non-credit co-operatives ; with a view to ensuring that the lending policies and procedures at different levels of co-operative sector are in tune with the requirements of sound banking, they considered it desirable to maintain a close co-ordination between the Rural Credit Department of the State Bank and the Agricultural Credit Department of the Reserve Bank. As regards the provision of production or development credit for agricultural purposes to cultivators, the Group recognised that, under the framework of agreed policies, this responsibility was to remain with the co-operative credit structure, which was expected to discharge it with appropriate assistance from the Reserve Bank. Thus, the State Bank of India had been, and continues to be assigned a role of supplementary financing agency, the primary one being that of the Reserve Bank.

The objectives are : (1) To have one strong state-partnered, bank with a number of branches spread over the country. (2) To provide larger and extended remittance facilities to the cooperatives and other banks. (3) To follow a policy which would be in agreement with the national policy in the field of banking.

Functions of the State Bank

The State Bank of India undertakes the following functions particularly in the field of rural credit :

(a) It stimulates and accelerates the development and growth of cooperative banking through general assistance in remittance facilities

to cooperative banks, provides short-term credit to them and subscribes to the debentures of the Central Land Development Banks.

(b) It assists in the financing of cooperative marketing and processing societies.

(c) It renders all possible assistance to the scheme of warehousing in the country.

(d) It provides financial aid to industrial societies for working capital.

(e) It coordinates its policy with those of the cooperative financial structure.

By June 30, 1977, 1869 branches in rural and 1417 branches in semi-urban areas were opened with a view to developing banking habits amongst the people of these areas.

Remittance Facilities. The S. B. I. provides the co-operative societies remittance facilities to all State Co-operative banks and their affiliated units thrice a week, upto Rs. 5000/- with a minimum of Rs. 10000/- from any office of the S. B. I. to the principal account it maintains with the R. B. I. (ii) Within certain limits, the S. B. I. also provides free remittance facilities to co-operative banks, once a week in multiples of Rs. 100 with a minimum of Rs. 1000 to each of its branches or affiliated central or industrial co-operative banks and a Central Co-operative Bank, to each of its branches. (iii) Some free remittance facilities are also provided for transfer of funds between a Central Land Development Bank and each of its affiliated primary land development banks or its branches. Such facilities are granted by the S. B. I. under both the R. B. I. and S. B. I. scheme.

Financial Assistance to Co-operative Banks. Loans are granted by the S. B. I. to the Apex and Central Co-operative Banks against government securities and debentures of the central land development banks for augmenting their liquid resources at 1/2 per cent below the S. B. I. advance rate. Advance are also allowed on the repledge of produce to the co-operative banks at 1/4 per cent of the S. B. I. advance rate. Advance are granted for financing the marketing of agricultural produce, distribution of fertilizers and agricultural implements and for procurement operations in the State. Advances are also granted to the Central Cooperative Banks on the guarantee of the Apex Central Bank for the above purposes.

It also grants advances to debenture holders on the security of those debentures with a view to improving the marketability of the debentures of the central land development bank.

Financial Aid to Marketing and Processing Societies. (i) The S.B.I. also provides financial assistance to marketing and processing societies both directly and indirectly through the normal cooperative banking channels. Accommodation to such societies is provided

against the pledge of product upto 70 to 75 p.c. of its value. Interest on such loans is charged at 1/2% per annum ; and over-all incidence of interest (including godown rent, insurance and other charges from the borrower) is kept as low as possible. (ii) Clean accommodation is also provided upto their own funds on the guarantee of the apex/central cooperative banks/apex marketing societies. (iii) The S. B. I also provides credit facilities to cooperative sugar factories by way of interim accommodation in the form of loan against state guarantee. Advances are also made to these factories against the pledge of sugar stocks and other stores which are readily saleable. Clean loans are also granted upto a limited size for providing working capital. These societies are also given loans and credit facilities and deferred payment guarantees, to cover the import of machinery and capital goods on the security of the general assets of the society or the State Government guarantee.

Assistance to Warehousing. The S. B. I. grants advances against warehouse receipts. Such grants are utilized for providing facilities for stocking agricultural produce both to individual traders and to the cooperative societies.

Coordination of Activities/Policies. The S. B. I. has a clear cut policy to see that its activities are coordinated and do not clash with those of the cooperative institutions.

The S. B. I's role in the field of rural credit is essentially of a supplementary nature. It provides finances in areas where the central financing agencies are relatively weak and the areas are cooperatively backward.

Village Adoption Scheme. Under the scheme of the Village Adoption of the S. B. I. selected villages are adopted for intensive financing of agriculture to cover all the variable and potentially variable farmers. As on Dec. 31, 1976, the S.B.I. adopted 16,621 villages serving about 6 lakh farmers under the scheme. The outstanding level of credit advanced to these was Rs. 114.2 crores.

Agricultural Development Branches. The S. B. I. grant extends assistance, under the scheme, for agricultural development, through its special branches opened for the purpose in consultation with the concerned States and the A R D C. At the end of Dec. 1976, there were 256 A D B(166 in the backward districts) and the total credit provided by these branches to over 6 lakh farmers stood at Rs. 130.5 crores.

The S. B. I's branch expansion programme is coordinated with the development of credit facilities. The S. B. I.'s offices increased from 462 in rural and 796 in semi-urban area in 1968-69 to 1869 and 1417 respectively in 1976-77.

It would not be incorrect to say that the S. B. I. has played a useful role in augmenting the resources of cooperative banks for financing marketing and processing societies, industrial cooperatives, consumer cooperative stores etc. But its services can be made more

effective if the borrowing institutions take initiative in getting the procedural delays removed.

RESERVE BANK OF INDIA

The Reserve Bank of India was set up under Reserve Bank of India Act, 1934, in 1935. In order to provide agricultural finance to the cooperatives, a separate Agricultural Credit Department was created in the Bank in 1935 (under Sec. 54 of the R. B. I. Act) to : (i) maintain an expert staff for studying all questions relating to agricultural credit ; (ii) to provide expert guidance to the governments and to cooperative institutions in matters of credit ; (iii) to finance the movement of crops and other agricultural operations through State Cooperative Banks and other suitable agencies of rural credit ; and (iv) to coordinate the operations of the Bank in connection with agricultural credit and its relations with state cooperative banks.

From 1942 to 1949, the role of the R. B. I. was limited to that of the "lender of the last resort", in so far as the cooperative movement is concerned. It was lending under Sections 17 (2) (b) and 17 (4) (c) of the R. B. I. Act to the State Cooperative Banks and through them to the cooperative societies against government securities, agricultural bills and promissory notes of the cooperative banks and debentures of approved land development banks, at a rate lower than the Bank rate for seasonal agricultural operations and for marketing of crops and to tide over the financial crisis for short periods. Till 1942, no cooperative bank had approached the R. B. I. for assistance except very small amounts by way of advances against Government securities. This unhappy situation was due to the limitations under which the Bank advanced loans. *First*, loans could not be advanced directly to agriculturists. It had to be passed through the co-operative banks first at the state level and then at the district or village level. This necessitated the existence of a state co-operative bank and a co-operative credit society in the state and the village, which requirement was not readily fulfilled before 1947. *Second*, the bills could be discounted only for a short period and that too for seasonal agricultural operations for the marketing of crops. *Third*, the provision regarding the advance of security of goods pledged practically remained inoperative due to lack of warehouses and the absence of good rediscountable bills. Thus, till 1949, the R. Bank's role in providing rural finance was insignificant. For instance, in 1949-50, the co-operative banks borrowed only Rs. 2.71 crores from the R. B. as against the total demand for rural credit estimated at about Rs. 800 crores a year.

As a result of the recommendations made by the Informal Conference on Rural Finance, of officials. non-officials, in 1951 the R. B. I. was unable to work more efficiently within the existing frame work ; for enlarging scope of rural credit and for eventually designing a new and coordinated frame-work in the light of the facts to be ascertained.

Accordingly, a number of radical procedural changes were accepted in regard to its loan operations with a view to liberalising the scope and extent of the accommodation to the state cooperative banks. The credit limits for the state co-operative banks were widened. Loans were given for seasonal agricultural operations and marketing of crops to these banks against the guarantee of the State Governments or on the security of bills and promissory notes carrying two good signatures. These banks were allowed to draw and repay any number of times against the credit limit provided their total outstanding did not exceed the limited amount sanctioned to these banks.

Amendments were made in 1951 and 1953 in the Act, as a result of which : (i) the State Co-operative Banks were placed on the same footing as the scheduled banks in so far as the purchase, sale and discounting of bills of exchange and pronotes were concerned, (ii) The period of accommodation for seasonal agricultural cooperatives and marketing of crops was increased from 9 to 15 months [Sec. 17 (2) (a)]; (iii) Mixed farming activities allied to agriculture processing of crops etc. were included as valid reasons for advancing loans [Sec. 17 (2) (b)]; (iv) Loans could now be advanced to the cottage and small scale industries through the State and Central Co-operative Banks. [Sec. 17 (2) (bb)]; (v) Medium-term loans could be granted to the State co-operative banks against government guarantee for agricultural purposes for a period of 15 months to 5 years ; provided the aggregate loans did not exceed Rs. 5 crores. [Sec. 17 (4) (a)]. In 1955, this restriction of Rs. 5 crores was removed. In 1954, a scheme was formulated by the Agricultural Credit Department, for making advances to the State Co-operative Banks for marketing of crops at concessional rate.

The favourable effect of these measures enabled the State Co-operative Banks to make freer and fuller use of the financial accommodation provided by the R. B. I. In the words of the Rural Credit Survey Committee, "In recent years, few aspects of the working of R. B. I. has been so striking as its role in the sphere of rural finance".

Rural Credit Survey Committee

In 1951, an expert committee was set up under the Chairmanship of Shri Gorwala to plan, organise and supervise a survey regarding facilities available in rural areas for providing agricultural credit to the agriculturists and to make necessary recommendation. The Committee submitted its report in 1954. It found that there was a willful lack of credit in the rural areas. The cultivator was not able to satisfy his credit needs satisfactorily. It came to the conclusion that *agricultural credit as it is at present supplied falls short of the quantity, is not of the right type and by the criterion of need often fails to go the right people*. It also pointed out that by its own unaided effort the co-operative credit movement will not be able

to meet the credit requirements of the farmer. Its main findings were:

(i) In spite of years of its working, the co-operative credit movement was playing an insignificant part in the field of rural credit. (ii) By and large, it was the large cultivator who benefited from it. (iii) Lending was still mostly on the basis of security of tangible assets and not on the basis of productive requirements. (iv) The private interests of the trader-cum-money-lender were very strong and had derived further strength from the super-structure of urban trade and finance. (v) The co-operative structure at the lower levels was unable to get much help from the higher structure of co-operatives, which itself was a weak one, or from the State.

The Committee recommended : (i) An *integrated scheme of rural credit*, the salient features of which are: (a) State partnership in co-operative institutions at all levels; (b) full co-ordination between credit and other allied economic activities especially marketing and processing; (c) development of a net work of warehousing organisation; and (d) facilities for the training of co-operative personnel at all levels.

(ii) The Imperial Bank of India should be nationalised and through its branches it should provide vastly extended remittance facilities to co-operative and other banks and the endeavour should be responsive to the needs of co-operative institutions connected with inter-credit marketing and processing.

(iii) Suitable amendments should be made in the Reserve Bank of India Act and the establishment of a National Co-operative Development and Warehousing Board on all-India level.

(iv) The establishment of two Special Funds under the Reserve Bank and one Special Fund under the Ministry of Food and Agriculture. These are:

- (a) *The National Agricultural Credit (Long-term Operations) Fund* to which would be credited Rs. 5 crores annually besides an initial non-recurring contribution of Rs. 5 crores. This Fund was meant for giving long-term loans to State Governments to participate in the share capital of co-operative land mortgage banks and co-operative credit societies; and medium term loans to State co-operative banks for agricultural purposes; and long-term accommodation (for periods exceeding 5 years) to land development banks.
- (b) *The National Agricultural (Stabilisation) Fund* to which would be credited Rs. 1 crore annually. The Fund was to be utilised for the purpose of granting medium term loans to State Co-operative Banks specially when on account of famine, drought, or other calamities they are

unable to repay their short-term loans to the Reserve Bank. The fund was also to be used for converting short-term loans due to the R. B. I. from the Central Co-operative Banks in areas affected by scarcity conditions like drought, flood or locust menace.

- (c) *National Agricultural Credit (Relief and Guarantee) Fund* to which would be credited Rs. 1 crore annually. This Fund will be under the Ministry of Food and Agriculture and will be utilised for granting loans to Co-operative credit institutions, through the State Governments concerned for the purpose of writing off irrecoverable arrears specially after chronic and widespread famines.

These three Funds served as the main pillars on which rested the reoriented programme of rural finance to be operated on co-operative lines.

(v) Loans, particularly short-term loans, should be given on the basis of the anticipated crops not on the security of land and tangible assets. A "crop loan system" was to be evolved.

(vi) The economic viability of the co-operatives at the village level was essential. Each village society should be revitalized and reorganised and made really effective.

(vii) Relief and guarantee funds should be created at the national and state levels to assist in writing off irrecoverable debts arising out of natural calamities over a number of years consecutively.

The recommendations of the Committee were found faulty to the extent that : (i) although the Committee emphasised the need for greater state participation, it did not clearly realise the danger of people becoming too much dependent on the Government and losing their own initiative through State participation at different levels ; (ii) the Committee recommended the nationalisation of the Imperial Bank of India and the extension of commercial banking to rural areas without appreciating the fact that such a move could prove successful only if the rural mass acquired the banking habit of which there seemed no early prospect. In its absence the new branches of the State Bank of India in the rural areas would be a dead loss to the State Bank and through that to the nation without serving any worthwhile purpose ; and (iii) the State participation and financial help recommended by the Committee was not expected to solve the problem of rural credit. The problem is so enormous and the State finance put aside for this purpose so meagre that in spite of all tall talk of an integrated scheme it would take a very long time to make any impression on the problem. The conditions should not have been so bad if the State had not taken hasty action in the past in destroying the usual sources of credit in rural areas before the Government was in a position to fill the gap.

In brief, the whole scheme was based on the view that though the co-operative farm of organisation for agricultural credit was most suited to the condition of rural India, it has little chance of success unless it tackled the problem on a comprehensive scale as an integrated whole. This necessity implied that the co-operative structure must bring about an increase in co-operative credit for production along with co-operative marketing and more than that co-operative credit must become a part and parcel of general programme of agricultural development. Most of the recommendations of the Committee were accepted and on their basis the programme for the Second Plan was drawn up.

(a) The *National Agricultural Credit (Long-term Operation) Fund*, set up in February 1956 with an initial contribution of Rs. 10 crores and were augmented by further annual contributions in subsequent years and stood at Rs. 50 crores on 30th June 1961. (b) The *National Agricultural Credit (Stabilisation) Fund*, set up at the same time, with an initial allotment of Rs. 1 crore during 1955-56 received further contributions of Rs. 1 crore to each of the subsequent years. (c) The *Central Warehousing Corporation* was established in 1956 with an issued share-capital of Rs. 10 crores. (d) The *State Bank of India* came into existence on July 1, 1955, as the result of the taking over, under an Act of Parliament, of the Imperial Bank of India. In pursuance of a statutory obligation requiring it to open not less than 400 branches within 5 years, the Bank completed the first phase of its branch expansion programme, comprising of 400 branches. The Bank commenced its second phase of the branch expansion programme on the recommendation of a Sub-Committee of its Central Board that the Bank and its subsidiaries should open 300 additional branches in the rural and semi-urban areas during the quinquennium July 1, 1960 to June 30, 1965.

Rural Credit Follow-up Surveys

The Reserve Bank of India has been conducting a series of annual follow-up surveys of moderate scope since 1956-57. These surveys have been planned to investigate and assess in a few districts selected every year, (a) any significant changes and the situation on the 'demand' side of credit, including the outstanding debt and borrowings of different classes of cultivators, (b) the nature of the performance of different agencies on the 'supply' side of credit, including the manner of operations of the institutions set up under the Integrated Rural Credit Scheme recommended in the Report of the All-India Rural Credit Survey, 1951-52 and (c) any development of importance which may be taking place in the context of the larger socio-economic background of rural credit.

The first and the second follow-up surveys in this series relating to the years 1956-57 and 1957-58 were conducted in 11 and 12 districts respectively, selected from different states. The third

follow-up survey, covering the year ended June 30, 1959 was conducted in 5 districts, viz., Jalpaiguri, Mirzapur, Hissar, Ahmedabad, and Cudappah.

The important indicators for the survey were : (i) proportion of cultivating population covered by societies ; (ii) proportion of families borrowing from co-operatives ; (iii) proportion of amounts borrowed from co-operatives to the total borrowings, and (iv) the percentage increased in these indicators over a period.

The conclusions of the Survey gave widely different results but the salient points brought out are : (1) The proportion of dormant societies was very heavy in Bihar and W. Bengal. (2) The proportion of rural populations covered by co-operatives was very low in Bihar, West Bengal and Rajasthan. (3) The resources position and the level of advances were poor in Bihar, Rajasthan and W. Bengal, (4) Proportion of co-operative borrowings to total borrowings was high in Maharashtra and Gujarat followed by Tamil Nadu, Andhra Pradesh and Punjab. It was very low in Bihar and Rajasthan. (5) While advances were low, the proportion of overdue was high in Bihar and West Bengal. Thus, the co-operatives were relatively well-developed in Maharashtra and Gujarat followed by Tamilnadu and A. P. In the states of Bihar, West Bengal and Rajasthan the level of co-operative development was very low. The remaining states of Punjab, M. P. and U. P. occupied the middle position.

Some of the factors responsible for the uneven growth of co-operatives mentioned in the Report were :

(i) differences in co-operative credit structure obtaining before the initiation of the Second Plan, (ii) varying degrees of efforts put into reorganisation of the co-operative credit structure : (iii) differences in patterns of land ownership and nature and scope of land reforms legislation and progress in its implementation ; (iv) various types of agricultural economy ; (v) differences in regard to administrative, and procedural arrangements regarding audit, supervision and inspection ; (vi) role played by central co-operative banks ; (vii) variations in the loan policy adopted by Central Co-operative Banks ; (viii) uneven development of marketing co-operatives ; (ix) inadequacy in regard to the performance of the primary credit societies ; and (x) inadequate inter-linking of credit with marketing and organisation of processing co-operatives.

The Survey observed that "in the context of the remarkable progress recorded by co-operatives the unevenness in their development emphasizes the need for (1) efforts at reorientation of the loan procedure in order to vest the powers of scrutiny of credit limits in the central financing agencies, (2) large measures of efforts at introducing crop loan system, (3) relatively greater emphasis on making the primary credit society a 'viable' unit, so that it is in a position to employ a full time trained secretary, (4) a more determined effort

at implementing the policy regarding state participation in co-operatives, (5) vesting powers of supervision in central financing agencies, (6) promoting a more rapid growth of co-operative marketing through planned efforts at improving the efficiency of marketing co-operatives and at developing processing units in the co-operative sector and (7) interlinking of credit with marketing.

Recommendations of Committee on Co-operative Credit

In 1960, the Committee on Co-operative Credit (under the chairmanship of Shri V. L. Mehta) recommended that terms of grant of loans by the RBI to cooperative banks should be liberalised. Accordingly, the Central Cooperative Banks became eligible for loans from the RBI through their Apex banks. To enable cooperative banks to meet the increasing working capital requirements for production of crops, the Banks has enhanced eligibility limits for sanction of credit for banks on the basis of the audit classification 'A' class banks are given credit limits to the extent of 4 to 6 times their owned funds ; 'B' class banks to the extent of 4 times their owned funds, and 'C' class banks upto 3 times of their owned funds against government guarantee and on the recommendations of the Registrar. The rate of interest charged is 2% below the Bank Rate. It is concessioned if the finances are made for seasonal agricultural operations against government and other trustee securities but it would be higher if it is obtained for general banking purposes even against the same security.

Recommendation of the Rural Credit Review Committee

The All India Rural Credit Review Committee (1969) reviewed the procedure of the RBI advances to cooperative banks and on its recommendations, the Standing Advisory Committee of the RBI was set up. This Committee has been given the status of Agricultural Credit Board (in 1970), whose functions are confined to issue of policy and procedures. (i) It provides refinance facilities to cooperative and commercial banks for agricultural purposes and to cooperative banks alone for non-agricultural purposes ; (ii) it operates the National Agricultural Credit (Long term operations) Fund and the National Agricultural Credit (Stabilization) Fund ; (iii) it looks after the working of the Agricultural Credit Department and the Agricultural Refinance Corporation and all other matters relating to the re-financing, promotional, coordinating and regulatory functions of RBI, in the field of rural and cooperative credit.

Statutory Control of the RBI over Cooperative Banks

After the enactment of the Banking laws (Application of Cooperative Societies Act, 1965), the RBI has assumed a statutory control over cooperative banks with a view to bring about an orderly growth and development of the banking sector. The Act envisages the following :

(i) The Act is applicable to State and Central cooperative banks and all primary cooperative banks with a paid up capital of Rs. 1 lakh and over.

(ii) All existing banks should get a licence, within three months of the commencement of the Act, from the RBI. The RBI has the power to cancel the licence if it feels that the affairs of the cooperative banks are not properly managed.

(iii) The scheduled state cooperative banks are required to maintain a balance equal to 3% of their demand and time liabilities with the RBI ; while the non-scheduled state cooperative banks are required to keep their cash reserves at the above level with themselves/or RBI or with the State Bank of India.

(iv) The Central and Primary cooperative banks are required to maintain cash reserves equal to 3% of their time and demand liabilities with the State Cooperative banks.

(v) The cooperative banks are required to maintain liquid asset of their demand and time liabilities, either in the form of cash, gold or securities.

(vi) Cooperative banks, except the Central cooperative banks, are required to obtain the permission of the RBI for opening branches.

(vii) The R. B. I. has the power to conduct inspection of all the cooperative banks through its own machinery.

(viii) Restrictions are put on giving unsecured loans to Directors in the case of primary cooperative banks. No cooperative bank can advance loans on the security of their own shares ; nor can it hold share in any other cooperative society except as permitted by the RBI.

(ix) The RBI has the power to give directions to cooperative banks regarding the purpose for which advances are to be made, the margins they must maintain, the maximum amount of advances made under certain circumstances, the rate of interest etc.

(x) Cooperative banks are also required to submit to the RBI statements, returns and documents from time to time.

Reserve Bank Credit to Cooperatives

The RBI is providing short-term, medium-term and long-term credits to agriculture through the cooperative societies. This is evidenced by the fact that both the amount of advances and outstandings have increased considerably since 1951-52. During 1976-77, credit limits sanctioned by the Bank for financing agricultural operations to the State Cooperative Banks increased to Rs 696 crores from Rs 612 crores in 1975-76. The programme of loans advanced by the Bank would be clear from the data given below :

Advances to State Cooperative Banks (In crores of rupees)

Year	Advances	Outstanding
1951-52	11.29	7.81
1955-56	23.80	12.98
1960-61	146.66	89.40
1964-65	283.49	148.63
1965-66	—	172.17
1970-71	—	288.70
1975-76	890.0	491.5
1976-77	1,040.8	666.8

(a) Short-term finance

Such loans are provided by the RBI to accommodate the State Cooperative banks for financing seasonal agricultural operations and marketing of crops against the guarantee of the State Bank of India or against the security of Government and trustee securities belonging to them or to their affiliated central banks on two good signatures provided by the Central and State cooperative banks. These loans are provided for 12 months at a concessional rate of 2 p. c. below the Bank Rate. Credit limits are sanctioned after a careful scrutiny of (a) the position of the borrowing institutions in respect of owned funds, maintenance of liquid resources and reliability of its loans ; (b) its estimated credit requirements as indicated by the loan programme ; and (c) its past performance in the utilization of credit limit sanctioned to it.

Two important conditions attached to the short-term accommodation sanctioned by the RBI relate to non-overdue cover and 'the minimum involvement'. The former requires that, corresponding to the amount drawn and outstanding on a credit limit of the RBI there should be outstandings of at least an equivalent amount of non-over due loans due to the Central Cooperative bank from the societies for the same purpose. No further draws on the credit limit are allowed by the RBI if there is a deficit in this regard. The conditions of minimum involvement requires that on any date, the amount of agricultural loans outstanding to a central bank from out of its own resources should not fall short of the amount which the RBI might specify as the extent of stipulated minimum involvement. This is intended to secure that the cooperative banks employ more of their resources in agricultural loans and that a sufficient volume of own resources of the bank is involved in such loans in order to provide for funds which may be locked up in overdue loans.¹

From July 1, 1973, a new scheme is in operation, which links the availability of concessional finance for short-term agricultural purposes with the extent of deposits mobilized by the Central cooperative banks and utilized for agricultural lending: The

1. *Report of the All India Rural Credit Review Committee, 1969, p. 13.*

lending rate on limits sanctioned for seasonal agricultural operations is 1/2 p. c. below the Bank rate instead of the usual 2 p. c. below the bank rate ; however, a rebate of 1.5 p. c. is allowed upon fulfilment of the stipulated linking borrowings with deposit mobilization. No financial accommodation is available to Central Cooperative Banks, if their total overdues exceeded 60 per cent of the demand at the end of the latest cooperative year.

Since 1950-51, the short-term credit limit has been of the following order :

Short Term Accommodation to Cooperative Banks by RBI

Year	Limits sanctioned (Rs. crores)	Outstandings (Rs. crores)
1950-51	7.5	...
1955-56	30.0	13.0
1960-61	112.0	101.0
1965-66	213.0	144.0
1969-70	370.0	214.0
1972-73	415.5	144.9
1973-74	430.8	150.8
1975-76	751.4	182.2
1976-77	812.5	260.7

The total limits sanctioned in 1976-77, for seasonal agricultural operations increased to Rs. 812.5 crores from Rs. 415.5 crores in 1972-73. Aggregate withdrawals against the limits sanctioned and repayments during 1973-74, were Rs. 1033.6 crores and Rs. 1127.7 crores respectively as against Rs. 596.7 crores and Rs. 603.8 crores in 1972-73. The total outstandings at the end of June 1977 amounted to Rs. 260.7 crores as against Rs. 144.9 crores as at the end of June, 1973.

Short-term loans are also given for marketing of crops other than cotton and *kapas* ; marketing of cotton and *kapas*, production and marketing of handloom products (at 1½ p. c. below bank rate) financing other cottage and small scale industries, purchase and sale of yarn and loans to Agricultural Refinance Corporation at Bank rate.

Relevant data for 1972-73 and 1976-77 are given below :¹

1. R. B. I., *Report on Currency and Finance*, 1976-77, p. 137, F. 30

Reserve Bank Credit to Cooperatives 1972-73 and 1976-77 (Rs.crores)

Purpose of Finance	1972-73				1976-77			
	Limit sanctioned.	Drawals	Repay-ments.	Out stand-ings	Limits Sanc-tioned.	Drawals	Repay-ments	Out stand-ings
SHORT TERM								
(i) Seasonal agricultural operations (at 2% below bank rate.) ¹	415.53	596.67	603.84	144.91	812.5	904.8	826.3	260.7
(ii) Marketing of crops other than cotton and Kapas.								
(iii) Marketing of cotton and Kapas ² at 3% above Bank Rate	52.83	122.94	121.29	3.50	31.5	4.6	4.3	0.2
(iv) Purchase and distribution of fertiliser (at 3% above Bank Rate) ³	14.75	7.50	13.51	2.75	32.2	12.2	31.2	9.9
(v) Production and marketing of handloom products (at 1 1/2 % below Bank rate)	13.99	9.13	19.91	7.73	26.4	35.8	32.2	15.0
(vi) Financing other cottage and small scale industries ⁴	0.56	0.30	0.22	0.11	6.7	3.9	2.4	3.9
(vii) Purchase and sale of yarn (at Bank rate) ⁴	0.92	0.09	0.06	0.03	0.6	0.3	0.1	0.2
(viii) Loans to ARC (at Bank rate)	15.00	4.89	1.19	3.70	10.0	Nil	1.7	Nil

(N.B : 1. 1/2 per cent below Bank rate from 1973-74 subject to rebate of 1 1/4 per cent as per rebate scheme excepting under section 17 (4) (a) which continued to be at 2 per cent below Bank Rate.

2. Including monopoly procurement of cotton.

3. Prior to 1972, purchase and distribution of fertilisers was financed by bank rate by the Bank. However, from January 1972, the interest rate was raised 2 per cent above Bank rate with a view to aligning it to the lending rates of the commercial banks. It was further raised to 3 per cent above bank rate from 1974. Data relate to calendar year 1972 and 1976.

4. Data relate to financial year

(b) Medium Term Agricultural Credit

The medium-term finance is granted out of the National Agricultural Credit (Long term operations) Fund for (a) reclamation of land and other developments ; (b) construction developments, and maintenance of irrigation resources ; (c) purchase of machines, transport equipment, fertilizers, implements; (d) construction of farm houses and cattle sheds; (e) purchase of equipments for carrying on animal husbandry and allied activities ; (f) purchase

of milch cattle and poultry keeping by small and economically weak farmers and (g) financing smaller agriculturists to enable them to purchase shares of cooperative sugar factories. These loans are granted for periods extending from 15 months to 50 years to state cooperative banks against guarantee of the State Governments. The rate of interest is 2 p. c. below the bank rate.

Medium-term Loans (In crores of rupees)

Year	Sanctioned	Withdrawn	Outstanding
1955-56	0.31	—	—
1960-61	5.00	4.0	9.0
1965-66	14.00	7.0	15.0
1967-68	16.00	9.00	16.00
1969-70	18.00	13.00	20.0
1970-71	17.54	10.19	—
1972-73	8.72	—	16.88
1973-74	11.77	6.03	19.91
1975-76	65.1	49.0	94.8
1976-77	147.0	87.6	134.8

Purpose-wise grant of medium-term loans by the RBI of co-operative banks for 1972-73 and 1973-74 is given below :

Medium term credit to cooperative by the RBI¹ (Rs. crores)

Purpose of finance	1972-73 (July-June)				1976-77 (July-June)			
	Limit sanctioned	Drawals	Repayments	Out-standing	Limits sanctioned	Drawals	Repayments	Out-standing
1	2	3	4	5	6	7	8	9
(i) Agricultural purposes (at 1 1/2% below Bank Rate	8.72	—	7.42	16.88	14.9	9.3	7.7	17.0
(ii) Conversion of short term loans into medium term loans in scarcity affected areas (at 1 1/2% below Bank Rate	73.30	68.09	24.12	68.66	130.8	77.8	39.6	117.0
(iii) Purchase of shares in co-operative sugar factories/processing societies (at bank rate)	1.85	0.80	0.33	1.9	1.7	0.5	0.3	0.8

The RBI also grants medium-term loans from out of the National Agricultural Credit (Stabilization) Fund for converting

1. R. B. I., *Report on Currency and Finance, 1976-77*, p. 137.

short-term loans into medium-term loans to farmers in circumstances of distress. This Fund was created in July 1956, with an initial allotment of Rs. 1 crore and further contribution of Rs. 1 crore in each subsequent year. Conversion of short-term loans into medium-term loans is allowed only if the failure of crops in an area is not less than 50 per cent of the normal crop expected.¹ In 1976-77, the RBI sanctioned from this Fund, medium-term conversion limits aggregating Rs. 77.8 crores to State cooperative banks as against Rs. 73.5 crores sanctioned in 1972-73². Total drawals were Rs. 41.8 crores and Rs. 68.1 crores during this period. The Bank augmented the Fund by making a contribution of Rs. 20 crores, thus raising the total amount to the credit of the Fund to Rs. 165.0 crores at the June end, 1977.

(c) Long-term Agricultural Loans

Long term loans are given by the RBI for periods ranging from 5 to 20 years, out of the National Agricultural Credit (Long-term operations) Fund established in July, 1956 (with an initial contribution of Rs. 10 crores) which was augmented by further contribution of Rs. 5 crores in the subsequent years. Since 1960, the contribution was raised to Rs. 10 crores and by Rs. 1 crore each year so that the amount reached to a level of Rs. 15 crores in 1966-67. On 30th June, 1970, it stood at Rs. 172.0 crores and at Rs. 284.0 crores on 30th June, 1974. With the transfer of Rs. 95 crores, the total balance in the Fund stood at Rs. 495 crores at the June end, 1977. Loans aggregating Rs. 81.3 crores were sanctioned during 1976-77; and the aggregate drawals amounted to Rs. 271.3 crores.

For liberalising sanction of loans to states for participating in share capital of various types of existing cooperative societies, the Bank also sanctions loans to State Governments for contributing to the share capital of the farmers' service societies, which are being organised in various states at a minimum scale of Rs. 50,000 or Rs. 1 lakh depending upon the size of the societies.

This Fund is utilised for : (i) making of loans and advances to State Governments for subscribing directly or indirectly to the share capital of cooperative credit societies and repayable on the expiry of fixed period not exceeding 20 years from the date of making such loan/advances ; (ii) making to State Cooperative Banks, loans

1. Following types of loans cannot be converted into medium-term loans : (i) medium-term loans for agricultural purposes ; (ii) short term loans or cash credits granted to marketing and processing societies for marketing of crops ; (iii) short term loans for agricultural production which have already become overdue ; (iv) short-term agricultural loans advanced for the production of the rabi or the second crop ; and (v) short-term agricultural loans advanced out of Takkavi funds provided directly or indirectly by the Government or a Central Bank or a credit society.
2. Conversion was for the first time made in 1965-66, when short-term loans amounting to Rs. 3.57 crores were converted into medium term loans. During 1966-67, this amounted to Rs. 11.19 crores in 1967-68 to Rs. 2.02 crores (because of good crops) to Rs. 20.22 crores in 1969-70.

and advances for agricultural and other allied purposes for periods ranging from 15 months to 5 years, provided such loans are fully guaranteed by the State Governments ; (iii) making to central land development banks all loans and advances for periods not exceeding 20 years provided such loans are fully guaranteed by the State Governments ; and (iv) purchase of debentures of Land Development Bank provided such debentures are fully guaranteed by the State Governments.

For 1976-77, against the aggregate lending programme of Rs. 284.5 crores, the ordinary debenture programme of Land Development Banks was fixed at Rs. 88 crores ; but the amount issued by these banks was of Rs. 80.3 crores and the actual subscription collected was Rs. 74.3 crores.

Recent Developments

Since 1973-74, certain major developments have been made in the field of long-term credit viz : (i) *extending the scope of assistance to the weaker sections*, both tenants and share croppers are now eligible for long-term finance by providing tangible securities or securities of members who are owners of lands. Loans upto Rs. 500 in kind can be granted against the security of any other member.

(ii) *Bringing about a more balanced distribution of long-term finance among different States*, under which more attention is paid to States where per hectare outstandings are relatively poor ;

(ii) *Ensuring smooth flow of credit in areas of high overdues resulting from the prevalence of scarcity/famine conditions*, for this the Bank allows either to reschedule the loan instalments falling due during such year or to exclude such overdue instalments from the total demand for arriving at the percentage of overdues to demand ;

(iv) The rate of interest was increased from 9% to 9.5% to be charged to the ultimate borrower in respect of ordinary loans ; and

(v) The Central Land Development Banks have been granted permission to pay commission not exceeding 0.5% on the fixed deposits collected by the Primary L.D.Bs.

Long term credit to cooperatives by the R B I.

Purpose of finance	1972-73 (July-June)				1976-77 (July-June)			
	Limits Sanctioned.	Drawals	Repayment	outstandings.	Limits sanctioned.	Drawals	Repayment	Outstandings.
(i) Loans to state Governments for contribution to share capital of cooperative credit institutions.*	16.29	18.69	4.48	0.1	31.3	30.5	7.9	98.7
(ii) Loans to ARC (at 6% per annum)	30.00	30.00	0.50	34.50	50.0	50.00	15.8	172.6

*Data relate to financial years.

(Source : S.B.I.-Report on Currency & Finance, 1976-77, p, 137)

Other Contributions of the RBI

R.B.I. has also been rendering other useful service in the field of cooperation, like :

(i) **Provision of cheap remittance facilities for the benefit of cooperative banks.** This facility is allowed three times per week. Such facilities are available for inter-state transfer of cooperative banks up to Rs. 20,000/- or in multiples of Rs. 5,000/- in excess thereof between the accounts of two state cooperative banks maintained at the offices of the RBI.

Free remittance facilities are also provided for the amounts of loans and subsidies granted by the National Cooperative Development Corporation to the State Governments; and also for the refund of unutilized amounts by the State Governments to the corporation.

A cooperative society/bank may obtain Reserve Bank 'Bank Drafts' or 'Telegraphic Transfer' from offices of the RBI agencies and treasury agencies for remittances favouring itself or a third party at concessional rates of exchange.

(ii) **Training of Cooperative Personnel.** The RBI has been rendering useful services in the training of cooperative personnel since 1953. It instituted at the Bankers' Training College (run by it at Bombay) two courses for training of such personnel, viz., special course for managerial personnel of cooperative banks and a course on agricultural finance for the personnel of commercial banks. Another college, V. L. Mehta National Institute of Cooperative Management, began functioning from 1954 for the training of Senior and intermediate level personnel of the co-operative department.

(iii) **Publication of Literature.** The RBI has been playing a crucial role by bringing about various statistical and other information material on co-operatives, the important publications being (i) *Statistical Statements Relating to Co-operative Movement in India* (biennially) (ii) *The Review of the Co-operative Movement in India* (biennially) (a) *Cooperative News Digest* (Monthly) ; and R. B. I. Bulletin (Monthly). It has also published a large number of pamphlets and Reports on various aspects of rural credit and co-operative activities.

(iv) **Inspection of Co-operative Societies.** Periodical inspections of various co-operative organisations at the secondary and state levels are arranged by the RBI, from time to time to ensure that funds provided by it are being properly utilised and a sound method of keeping accounts is maintained.

(v) **Rehabilitation of Weak Banks.** About 55 Central Cooperative Banks exist as weak banks in the States of Andhra Pradesh, Karnataka, Uttar Pradesh, Madhya Pradesh, and Haryana etc. To such weak banks the RBI has suggested measures such as (i) taking

coercive measures for recovery from wilful defaulters; (ii) appointing of a supervisor for every 10 societies affiliated to the bank ; (iii) constituting a team of representatives of the RBI, Apex Bank, Central Cooperative Banks and the State Cooperative department for removing hindrances for the rehabilitation of the bank and providing assistance for the Central Cooperative bank in expediting the arbitration and recovery cases.

(iv) **Permission of Loans for Consumption Purposes.** As a measure taken for the liquidation of rural indebtedness, the Bank has permitted primary credit societies to issue consumption loans to members belonging to the weaker sections. The overall limit was placed at Rs. 300 per borrower. Such advances are treated as a legitimate charge on its resources.

CREDIT

Weaker Section-Oriented Policy

In consonance with the Government's economic policy statement, the RBI announced its new credit policy on Dec. 14, 1977. The tools used by the RBI are mainly the lowering of interest rates and provisions of additional refinance under the "Small Farmers Window."

The main features of this new policy are :

- (i) Direct individual loans granted to small farmers, after Jan. 1, 1978, for an amount not exceeding Rs. 2,500 each, will be eligible for refinance from the RBI at the Bank Rate of 9% per annum. For this purpose, RBI is to open a separate "Small Farmers Window" in addition to the existing refinancing rediscounting facilities. The extent of refinance would be limited to 50 per cent of the total advances made by concerned banks from January 1, 1978 onwards under this category. Banks are asked not to change more than 11% per annum on such loans irrespective of whether such facilities are granted for short medium or long terms. This inducement is specially to benefit small farmers.
- (ii) For stimulating capital investment in the small scale sector banks may charge not exceeding 11% per annum on all fresh term loans with repayment schedule of three years and above, sanctioned after January 1, 1978 to units falling under small scale units covered under Credit Guarantec Scheme and special guarantee scheme, (2) small road transport operators and (3) Small units in backward areas.
- (iii) As per the directive, for all fresh term loans sanctioned after January 1, 1978, with repayment schedule of 3 years and above, for the purpose of minor irrigation and land

development the maximum interest will not exceed 10.5 per cent per annum, and for fresh loan terms for "deversified purposes" as defined by ARDC the maximum interest will not exceed 11 per cent per annum.

- (iv) Banks have been asked to avoid compounding of interest charges on current dues not only on agricultural advances as hitherto but also on term loans to small scale sector and loans to small road transport operators and units in backward district/areas and to small farmers.

Thus, the Reserve Bank of India has played a very crucial role in the building up and rehabilitation of the co-operative movement through a large number of financial, and administrative measures. *First*, it has been playing an active and constructive role in rural credit as is evidenced by increasing amount of accommodations granted by it to the co-operative sector. *Second*, the Bank has played an important part in the formulation of scheme for the reorganisation of co-operative credit structure in different states. *Third*, it takes keen interest in training co-operative personnel of all cadres who are so very necessary for the success of the co-operative movement. *Fourth*, through its inspection it supervises the working of the financial institutions and gives overall guidance to them for improving their conditions. It has rightly been said by a foreign observer that "The Reserve Bank has been giving new life and potent leadership to the co-operative credit movement in recent years. Probably no other central bank in the world is doing so much to help develop and finance co-operative rural credit institutions." *Fifth*, it systematically undertakes research investigations and surveys relating to rural finance. Finally it is vitally concerned in building up a sound and self-reliant co-operative credit structure in line with the objectives of India's Five Year Plans.

The Reserve Bank of India may be compared to a reservoir from which channels of financial irrigation reach the field of agriculture and provide it with short medium and long-term finance, through the Apex Banks to the co-operative credit societies and through them to the agriculturists.

Future Role of the R. B. I.

In view of rapid agricultural development in the country and the programmes such as the Intensive Agricultural Production and Crash programmes, it is expected that co-operative banks may not be self-sufficient in meeting the increased requirements of the agriculturists unless bold efforts are made to further liberalise the procedure for granting loans and grants by the R.B. I.

Simultaneously, it would also be necessary for the State and Central cooperative banks to take vigorous steps to augment their own resources by way of share capital and deposits and only then it may be possible for them to take any substantial advantage of the

additional facilities which may be provided by the R. B. I. in future years.

The R. B. I. can further help to make the Integrated Crop Insurance Scheme a success by undertaking special research and enquiries on various facets of the prepare a well-thought plan of National Co-operative Insurance Scheme to be integrated with the rural credit plan.

Lastly, the R.B.I. should initiate different programmes for different states, keeping in view the existing conditions and previous experience. This will necessitate a change in the approach and methods of the Bank. At present, cooperative organisations and States Governments study the R. B. I. terms and conditions of loans only for achieving the greatest formal compliance so as to obtain the largest measure of assistance. Hence, the R. B. I. office need to develop informal contacts with the intimate knowledge of those incharge of cooperative organisation and must be able to function in an informal capacity.

AGRICULTURAL REFINANCE AND DEVELOPMENT CORPORATION (ARDC)

Agricultural Refinance and Development Corporation was set up under the Agricultural Refinance Corporation Act, 1963 with a view to provide finance (medium-term and long-term) for major agricultural development projects which cannot be satisfactorily financed by the existing institutional agencies like the land development banks and the scheduled banks, either on account of large outlay involved or because they a long gestative period or because the projects are such as cannot be brought under the normal business accepted by the land development banks.

Functions of the Corporation. The functions of the A R D C as defined in the Act, include :

(i) The provision of necessary resources by way of re-finance to the primary lenders for facilitating agricultural development covering a wide field including development of animal husbandry, dairying, pisciculture, poultry farming and stock breeding.

(ii) Purchase/subscribe the debentures floated by the Central Land Development Banks, State Co-operative Banks, scheduled banks, co-operative societies (approved by the Reserve Bank) in the normal course.

Refinance is routed through the Central Land Development Banks and other eligible institutions for financing special development schemes for increasing agricultural production, which though remunerative in character involve considerable investment or long period of waiting. Such schemes include :

(a) Land development, including reclamation, contour bunding, soil conservation, and preparation of land so that facilities for irrigation are fully used.

(b) Development of plantation/horticulture i. e., special crops such as rubber, tea, coffee, coconut, cashew nuts, arecanuts, cardamoms, orchards and vineyards, etc.

(c) Development of mechanical farming, use of electricity through digging of tube-wells and energising of pump sets.

(d) Development of animal husbandry, dairying, farming, pisciculture and poultry farming.

(e) storage/market yards.

(f) Agricultural aviation.

(g) Integrated Cotton Development Project (I C D P).

(h) forestry.

Re-finance is available by the Corporation to eligible institutions for financing the above schemes approved by it in two forms, viz., *one* subscription to the special development debentures floated by the Central Land Development Banks, and *second*, loans to State co-operative banks and scheduled commercial banks.

Direct financial assistance can also be provided, in exceptional cases, to cooperative societies approved by the Reserve Bank of India.

Loans and advances, otherwise than by refinance, may also be granted to approved co-operative societies repayable within 25 years.

A ceiling of Rs. 50 lakhs is fixed in respect of assistance granted by the Corporation in connection with individual transaction. Refinance facilities are available both for medium-term and long term loans. Medium term financial assistance is available for periods of 3 to 5 years. Long term assistance is restricted to a maximum period of 15 years, and in exceptional cases upto 20 years on merit. Corporation's rate of interest is 6 p. c. per annum.

Management of the Corporation. The management of the Corporation vests in a nine member Board of Directors, including the Managing Director and the Dy. Governor of the R. B. I. (in charge of Agricultural Department) as Chairman. Other directors include three representatives of the Government of India ; one of the R. B. I., and one each from Central Land Development Bank, State Co-operative Banks and Scheduled Commercial Banks, L. I. C., and Insurance and Investment companies.

At present there are 75 eligible institutions (named as above) which are the share-holders of the Corporation. Of these, 18 are Central Land Development Banks, 20 are State Co-operative Banks and 37 are Scheduled commercial banks.

Funds of the Corporation. The Corporation's authorised capital is Rs. 25 crores divided into 25,000 shares of Rs. 10,000 each. The

issued and subscribed capital is Rs. 5 crores consisting of 5,000 shares of Rs. 10,000 each, fully paid up and held by the R. B. I., Central Land Development Banks, State Co-operative Banks, Scheduled Commercial Banks, L. I. C., and insurance and investment companies. The shares are guaranteed by the Central Government as to the repayment of the principal and a payment of minimum dividend of 4 1/4 per cent per annum.

The Government of India provided the Corporation with an interest free loan of Rs. 10 crores. By the end of June, 1970, the total amount of loan given by the Central Government stood at over Rs. 26 crores.

The Corporation is authorised to raise further funds by issue of bonds and debentures, carrying Government guarantee, and accepting long-term deposits from the Central and State Governments, local authorities co-operative institution, scheduled banks and others. However, the aggregate amount borrowed in the form of loan and deposits is not to exceed 20 times of the paid-up capital and reserves.

Method of Working. The Corporation provides re-finance to the eligible institutions for such projects which, in its opinion, are :

(a) economically feasible, financially sound, operationally efficient;

(b) located in a compact area so that intensive supervision is possible ;

(c) cover specially the small cultivators. It also takes other factors into consideration such as the willingness of the farmers to avail of the scheme, their capacity to provide mortgage security, availability of power and water supply, commitment by the State Government regarding their share of contribution etc.

The financing institutions submitting the application for loan from the Corporation are required to give all possible details about the scheme, such as :

(a) the area of implementation ;

(b) arrangements for supervision and technical advice ;

(c) duration of the scheme ;

(d) ownership and valuation of land ;

(e) projections about the net increase in production ;

(f) the economic feasibility of the scheme ;

- (g) scale of finance per hectare and the repayment schedule ;
- (h) rate of interest to be charged ;
- (i) arrangements for short term finance for production and marketing ;
- (j) arrangements for assured supply of water, improved seeds, fertilizers and implements etc.

Before accepting the projects, the Corporation conducts thorough economic feasibility studies, technical feasibility studies, and cost-benefit analysis.

Evaluation of the Working of the Corporation. The Corporation completed 14 years of its working in June 1977. From the year of inception (1963-64), the Co-operative Land Development Banks started implementing special schemes with assistance from the A. R. D. C. By the end of June, 1978 since inception the A. R. D. C. had sanctioned 6221 schemes of agricultural development, involving a total financial outlay of Rs. 1796 crores and ARC's share of support of Rs. 1465.0 crores. Of these, Rs. 1049 crores were disbursed.

Progress of the Agricultural Refinance Corporation

Year	No. of schemes sanctioned	Total financial outlay	Corporations' commitment (Rs. crores)	Disbursal upto the end of the commitment	Disbursal as p. c. of the total commitment (Rs. crores)
1963-64	3	2.23	2.01	—	—
1964-65	8	11.02	9.35	4.45	10.1
1965-66	14	13.31	10.31	4.90	56.1
1966-67	13	9.18	7.36	6.98	48.8
1967-68	78	67.08	58.13	12.65	49.6
1968-69	108	79.21	69.32	30.49	52.0
1969-70	142	98.72	70.92	50.09	64.0
1972-73	230	196.6	172.3	94.10	87.3
1973-74	550	251.3	220.5	97.8	88.0
1975-76	909	356.4	296.9	171.2	57.5
1976-77	1653	367.9	307.1	220.8	58.0
1977-78	1836	392.7	330.1	234.3	60.5

Purpose-wise sanctions and disbursements during 1975-76 and 1976-77 (In Rs. crores)

Purpose	1975-76			1977-78			Since Inception		
	No. of Schemes	ADRC Commitments	Disbursements	No. of Schemes	ARDC Commitments	Disbursements	No. of Schemes	ARDC Commitments	Disbursement
Minor Irrigation	410	166.8	108.2	522	176.7	143.2	2,680	1033.7	731.5
Land Development	16	21.8	4.9	98	98.2	4.0	395	80.9	44.7
Form Mechanisation	264	79.5	45.8	246	31.7	28.7	954	169.5	145.3
Plantation/Horticulture	37	7.4	3.1	112	26.3	7.8	491	48.4	29.5
Poultry/Sheep breeding	25	1.0	0.7	79	4.4	2.1	199	8.0	4.4
Fisheries	31	5.2	2.4	125	12.0	5.4	291	23.7	14.4
Dairy Development	84	7.6	2.9	185	25.8	3.9	494	33.1	13.5
Storage/market yards	41	7.6	3.2	434	36.2	37.7	663	78.6	64.29
Aviation	1	...	...	...	...	...	3	0.4	1.7
ICDP	...	...	...	15	5.8	0.5	14	0.1	0.6
Forestry	...	...	...	1	0.5	0.6	17	3.6	0.6
Gobar Gas	...	...	...	19	1.5	...	20	...	0.1
Total ..	909	296.6	171.2	1,836	330.1	234.3	6,221	1475.9	1049.3

It will be evident from the above table that the largest share of the amount sanctioned has gone to the development of minor irrigation, followed by that for soil conservation, development of plantations and horticulture, farm mechanisation, poultry farming, development of dairy and fisheries and construction of storage facilities.

Most of the amount was drawn by the Land Development Banks, in Gujarat, followed by Tamil Nadu. U. P., Punjab, Andhra Pradesh, Maharashtra and Haryana respectively.

This poor utilisation can be attributed to the following reasons:

(1) The time consuming procedure prescribed by the Corporation for providing re-finance, (2) Since the Land Development Banks could avail of refinance facilities only for schemes involving an outlay of more than Rs. 5 crores, the schemes involving smaller investment cannot be financed by the Corporation, (3) Absence of effective co-ordination between various agencies involved in implementation of these schemes, (4) Non-availability of heavy machinery for reclamation work ; delay in conducting contour surveys, delay in the release of water from the irrigation projects etc. (5) Delay in the recruitment, training and posting of the staff in the various departments of the State Governments and the *financing banks*.

The achievement in physical terms under the various schemes, as on June 30, 1978, was as follows :¹

1. Tubewells 254,300 ; dugwells 390,000; electric pumpsets/oil engines, 576,200 ; lift irrigation 760 and others (boring and rahats) 9,500.
2. Plantation in hectares :
Coffee, 8,900, rubber 2,200 ; cardamom, 1400 cashewnut, 1,100 ; coconut 34,200 ; arecanut 1,300 : apple, citrus and other fruits, 19,900.
3. During 15 years (1963-1978), the corporation assisted in bringing about 28.5 lakh hectares under multiple cropping. Land developed under the command area and area improved under soil conservation schemes aggregated 8.9 lakh hectares. The total area developed under various schemes for plantation and horticulture is of the order of 72,300 hectares.
4. Other activities which received refinance facilities were :
Storage 50.0 lakh tonnes ; market yards 121 units ; tractors 34,600 units ; combine/harvester/bulldozer/power tiller 988 units ; trawlers/mechanised boats, 1,675 units ; milch cattle 66,700 animals poultry birds 1081,500 chicks ; sheep 119,490 animals and agricultural aircraft 2 units.

1. Report of the Agricultural Refinance & Development Corporation for 1977-78, pp. 14-15.

Distribution of ARDC Scheme by Type of Banks (Rs. crores)

Scheme implemented through :	1972-73		1977-78	
	No. of schemes	Amount	No. of schemes	Amount
State Land Development Banks	116	164.4	330	147.5
State Cooperative Banks	10	2.8	41	14.7
Scheduled Commercial Banks	104	29.4	1465	230.9
Total	230	196.6	1836	392.7

The International Development Association (IDA) assistance to Kerala agricultural development project amounted to dollar 30 million in 1977. This is intended for development of coconut, cashew, cocoa, spices, pepper and rubber crops besides energisation of pump-sets in minor irrigation projects. Besides, an integrated fisheries Development project for Gujarat with an assistance of dollar 18 million has also been sanctioned. As at the end of June 1977, there were 29 projects assisted by the World Bank. The disbursement from the IDA/IBRD projects amounted to Rs. 477.0 crores by June 30 1977. Since 1970, 30 projects are being implemented with the assistance from the World Bank Group. These consist of 12 agricultural credit projects, 6 Command Area Development Projects, 3 dairy development projects, 2 seeds projects, 2 market yard products, 1 apple processing and marketing project, 1 fisheries project, 1 integrated cotton development project, and 2 general lines of credit to ARDC. 9 of the agricultural credit projects, viz., Gujarat, Haryana, Andhra Pradesh, Tamil Nadu, M.P., Maharashtra, Punjab, U.P. and Karnataka have been fully implemented.

A number of measures have also been taken by the ARDC for removing regional imbalances in refinance, such as :

(a) Establishment of consultancy units at Lucknow and Calcutta to help State Government and financial institutions to identify and assess the potential for various items of investments.

(b) Strengthening its regional offices in Eastern and North-eastern regions; and

(c) Provision of refinance facilities to the eligible institutions up to 90 per cent of the financial assistance for schemes sanctioned in Eastern and North-eastern regions irrespective of the purpose of the scheme.

In pursuance of its policy to provide 90 per cent concessional refinance facilities to SFDA/MFAL schemes, special schemes

sponsored under the DPAP Gritjan Corporations and special schemes intended for scheduled castes and tribes.

Suggestions of the Rural Credit Review Committee

The recommendations made by the All India Rural Credit Review Committee may be given as below:

(1) The ARC should play effective role not only by providing re-finance facilities, but also by giving proper advice in regard to various features of a sound system of investment credit for agriculture.

(2) The Corporation may raise its existing paid up share capital of Rs. 5 crores to Rs. 25 crores by issuing 10 per cent more shares on suitable terms, as early as possible.

(3) The Corporation should formulate detailed mechanics of development lending in respect of various schemes, for the guidance of the financing institutions.

(4) The Government of India should make available to the Corporation as much resources as possible out of the external assistance available to it, at a low rate of interest. The RBI might also charge a concessional rate of interest on the funds provided to the Corporation.

(5) The Corporation should continue to adopt a flexible approach in meeting the requirements of different areas and hold periodical consultations with different financing agencies and the State Governments in order to ensure that its policies and procedures are determined after keeping in view the diverse factors and circumstances involved.

For implementing the various schemes of the Corporation, the following suggestions have been made by the All-India Cooperative Land Development Banks Cooperative union.¹

(i) For effective coordination among the various departments and financing agencies, a project officer may be appointed for every scheme who will ensure that adequate arrangements are made by the concerned agencies and the farmers are properly guided.

(ii) There should be a liaison officer at the State level to ensure coordination between the financing agencies and the departments of the State Governments. This officer will ensure the availability of technical and administrative staff at levels and the issue of necessary financial orders in respect of Government guarantees for deficit in security, the flotation of special debentures, etc.

(iii) A state level Review committee may be appointed which should review at regular intervals the implementation of various schemes.

1. *Journal of All India Central Land Department Bank Co-operative Union*, June 1968, pp. 1-3.

(iv) The Central Development Banks should educate the farmers in the area about the benefits accruing from the implementation of the scheme concerned.

REGIONAL RURAL BANKS

The idea of providing rural finance to the small and marginal farmers and landless workers goes to the observation made by the All India Rural Credit Review Committee in 1969. It pointed out that "Cooperations and other competing and supplementary agencies should co-exist for rural development. The requirements of the agricultural sector are so large and diverse that both the commercial banks and cooperative banks can play a complementary role without getting into conflict with each other". It, therefore, recommended that multiagency approach be adopted for supply of rural credit and for this it recommended the establishment of a Small Farmers Development Agency. Later on, in December, 1971, the National Commission on Agriculture (in its Interim Report on Credit Services for Small and Marginal Farmers and Agricultural Labourers) expressed the view that it might be ultimately necessary to set up an agricultural development bank of India on the lines of the Industrial Development Bank of India. The idea was to consolidate the expertise and experience of various agencies (such as the Agricultural Credit Department of the Reserve Bank of India, the Agricultural Refinance Development Corporation and the Agricultural Finance Corporation) into a single national organisation in order to direct the flow of agricultural credit according to priorities for a fuller utilisation of land and manpower. The ADBI could provide the initiative and expertise for project-oriented lending after special studies and surveys on regional and commodity wise basis. The NCA's suggestion were based on the report of the study group set up by it in December 1970 under the chairmanship of Mr. T. A. Pai (then chairman of RIC).

But the Banking Commission did not favour the setting up of an Agricultural Development Bank. It said that the purpose would be served by merging the Agricultural Refinance Development Corporation, a subsidiary of the Reserve Bank, and the Agricultural Finance Corporation, which was set up by commercial banks. The Banking Commission favoured this merger, because the ARDC had already developed considerable expertise in project-oriented loaning, and the AFC had developed its own expertise for identifying and formulating potential agricultural project. Also, with the merger the resources of both could be put to effective use."

The Central Government realised that the multi-agency scheme, which was put into operation during 1970-71, did not prove quite successful. Apart from the fact that the small and marginal farmers have to contact different agencies, for different purposes, their credit needs are not being adequately met.

The suggestion of Rural Banks was made in 1972 by the Banking Commission, which recommended such banks for compact

groups of villages, mostly autonomous in character and managed by the local leadership to ensure local response and participation.

A Working Group, headed by Shri Narasinhham had also surveyed the requirements and feasibility of the regional banks and concluded that only 5 banks should be started in select areas which are starved for want of institutional credit facilities either from commercial or cooperative banks.

An Ordinance was promulgated for setting regional rural banks on September 27, 1975. Accordingly on October 2, 1975, five banks were established in four states ; 2 in U.P one at Moradabad by the Syndicate Bank and the other at Gorakhpur by the State Bank of India ; 1 in Rajasthan by the United Commercial Bank, 1 in Bhiwani Haryana by the Punjab National Bank and 1 in Malda (West Bengal) by United Bank of India. By April 1977, in all 50 Regional Banks were to be opened , covering a population of at least 1 crore. These banks would be serving the majority of 32 districts.

Each Bank has an authorised capital of Rs. 1 lakh and paid-up capital of Rs. 25 lakhs. The share capital is raised by the Central Government, the State Government concerned and the sponsoring bank in the ratio of 50,15 and 35. There is no participation of other institutions and individuals in the equity of the regional rural banks.

These banks have a Board of Directors of 9 members ; 4 to be appointed by the Central Government, 2 by the dominant nationalised banks, 1 by the State Government, and 2 by the Govt. of India from amongst other share holders.

These banks combine the good features of both cooperative and commercial banks and exclusively provide credit to small and marginal farmers, agricultural labourers and rural artisans.

These regional rural banks, are basically scheduled commercial banks but are different from the existing commercial banks in the following respects :

(1) Their area of operation is limited to a particular region comprising one or more districts in any state.

(2) They grant loans and advances particularly to small and marginal farmers, agricultural labourers and rural artisans, small entrepreneurs and persons of small means engaged in trade and other productive activities in the area of operation.

(3) The lending rates of the banks is not higher than the prevailing lending rates of co-operative societies in any particular state.

(4) The salary structure of the employees of the regional rural banks is prescribed by the Central Government, having regard to the salary structure of the employees of the state government and local

authorities of comparable level and status in that area of operation of the bank.

The areas where regional rural banks are set up are comparatively backward or a tribal area or where coverage by the commercial banks and cooperations is relatively poor. *Secondly*, the area has a real potential for development and should be poised for a break through once the flow of credit is assured.

These Banks grant loans mostly for production purposes. But a small proportion may be earmarked for consumption purposes like educational or medical expenditure. A ceiling is placed on the limit of loans that can be sanctioned to an individual. They advance loan at 14% ; the same as cooperative societies charge.

In preparing the prospective branch expansion plan, banks are asked to include as many offices as possible in the unbanked and underbanked rural and semi-urban areas unbanked taluk and tehsil headquarters and under-banked and backward districts ; especially in the eastern and northeastern states. While preparing the branch expansion programmes banks are asked to keep in view centres, (a) with high deposit potential, (b) where the state governments are keen on having bank offices for implementing the various developmental schemes formulated by them, (c) where the applicant banks have undertaken or propose to undertake financing of special schemes with refinance assistance from the International Development Agency, Agricultural Refinance Development Corporation, (d) which are identified as potential growth centres in the surveys conducted by the identified lead banks and are still unbanked and (e) in adivasi, tribal belts etc.

At the end of June 1977, there were 48 RRB with 767 branches with a total coverage of 86 districts in 16 states. The total deposit mobilised aggregated is Rs. 15.7 crores and the credit extended to Rs. 19.6 crores.

Suggestion for Improvement

The Committee set up under the chairmanship of Dr M. L. Dantwala, to study the working of these banks has appreciated the over-all performance of these banks and opened that they should be made an integral part of the rural structure. According to the Committee, "the Regional Rural Banks have definitely an edge over branches of commercial banks in the rural credit secure with relatively lower cost of operation, simplicity and low profile local participation in management, the down to earth approach or the local staff and familiarity and close association of the rural developmental agencies and personnel."

The Committee has observed that with a few modification in their organisation and functional structures the RRB can become a very useful component in the totality of the rural credit structure. It has made the following major recommendations :

- (i) Each RRB should have a smaller area of jurisdiction covering a population of about 20,000 for better marginal efficiency

(At present some of the RRB's cover even a population of 10 to 15 lakhs).

- (ii) The RRB should function like any other commercial bank, under the direct control of the Reserve Bank of India.
- (iii) There should be a change in the share capital composition.
- (iv) The loaning and other business aspect policy should be modified and a uniform rate of interest be followed for all credit institutions catering to the requirements of the rural community.
- (v) Specialised training facilities should be imported by the sponsor banks to the personnel of the RRB.

CROP LOAN SCHEME

It has been realised that if co-operative structure is to serve fully the small or uneconomic farmer and to liberate him from the money-lender-traders, it must make credit available for all production and consumption needs of the farmer. Till recently, co-operative loans were made for a twelve months' period by the co-operative societies on the security of land in several States, notably in West Bengal, Orissa, Tamil Nadu, M. P., Kerala, Andhra Pradesh and Karnataka. Such loans were renewable. The utilization question was not properly considered while advancing loans, and severe limits on loans to individuals and to societies as a whole were laid down. The result was that in almost all cases the credit extended by co-operative societies did not serve fully the needs of the member. Under such conditions, the co-operative credit system could not hope to replace the money-lenders.

The need to change over to a purpose-oriented loan policy by adoption of the crop loan system, used in Maharashtra and Gujarat since 1950, was recommended by the Committee of Direction, (All-India Rural Credit Survey, 1954) and the V.L. Mehta Committee on Co-operative Credit, 1960. While these recommendations were accepted by the co-operations (both officials and non-officials) the scheme could not be implemented in several states for a long time.

Early Developments

As early as 1945, the Agricultural Finance Sub-Committee of the Policy Committee on Agriculture, Forestry and Fisheries, spelt out the main features of the crop loan system, which was adopted for providing agricultural credit to farmers on a rational basis. These features were :

- (i) The primary agricultural credit society should try to meet in full all short-term credit needs of its members, and subject to certain limitations, their medium term credit needs for agriculture .
- (ii) The credit-worthiness of a member should be assessed on the basis of his repaying capacity .

(iii) The society should have a statutory charge on the crop and mortgage security would be justified when the size and period of loan require it, and

(iv) The loan should be advanced only as required and as far as possible in kind.

These recommendations were accepted by the Bombay Cooperative Banks' Association and the erstwhile Government of Bombay. Consequently a loaning procedure, incorporating these principles, was adopted in the Bombay State from 1950. Emphasis was shifted, for the first time, from the security of the loan to the requirement of credit for production of particular crop which was being financed. The scale of finance required for each crop was determined in a field workers' conference held in each district much in advance of the cultivation season.

Objectives of the Scheme

The crop loan system seeks to replace the money-lender trader system in two ways : *first*, by shifting the emphasis from real property to crop as security has brought in even pure tenants as potential borrowers. *Second*, by relating the size of the loan to the requirements of business, it emphasized upon the productive purpose. It also did away with the older highly restrictive limits on credits to individuals and societies. The new system resulted in emphasis on production credit and benefited most those groups whose requirements of this type of credit were relatively large.

Logically, a developed crop loan system, thus, involves a full analysis of the credit requirements of a cultivator, and appropriate administration of the cash and kind supply, and recovery through sales or immediately after.

Necessity of the Scheme

It has been found that every tier of credit structure depends for its funds on the higher financing agencies than on its own resources of owned funds and deposits. In the context of the fiscal responsibilities which such an arrangement enjoining it may appear surprising that insistence on mortgage security for borrowings at the primary level is discouraged especially when borrowings are for agricultural production. This justification arises on account of these factors :

(a) While timely sanction and disbursements of agricultural loans are important for the success of the operation itself, insistence on mortgage of land security in each case would cause considerable delay.

(b) A large number of tenant farmers who do not have the right to mortgage the land they cultivate will have to be denied credit.

(c) Even those who own their land may not have adequate land to offer as security if they have already availed of a large medium term loan or a long-term loan from the land mortgage banks.

(d) Mortgage of the borrowers land does not always adequately protect the interest of the credit agency if the borrower defaults.

In view of these defects, it has been rightly said that "the best form of security for the loan advanced by the credit society would be that the clientele is a continuing one : and the land, which constitutes the means of production for the farmer, must not be alienated."

Action Programme

Though the Rural Credit Survey Committee had emphasized the need to change over to the crop loan system of financing in all parts of the country, yet the system was not adopted fully. Attempts later to get a rationalised lending procedure introduced in the 15 districts (selected for the Intensive Agricultural District Programme) also did not meet with much success. When a decision was taken to institute an Intensive Agricultural Area Programme (in 1963) in 114 districts, it became necessary to reorient the loaning policies of the co-operative credit societies to fully meet farmers' credit requirements to enable them to introduce improved agricultural practices. In the early part of 1964, an outline of Action Programme was drawn up and circulated by the Ministry of Community Development and Co-operation. This integrated programme involved : (i) strengthening of the co-operative banking structure ; (ii) reorganisation of primary institutions so as to have only viable and potentially viable units ; (iii) development of co-operative marketing ; and (iv) implementation of crop loan scheme of financing. To ensure viability, the area of operations of the societies was to be extended to enable them to have adequate credit and not-credit business. Their share capital was to be strengthened by adopting an increased ratio between shareholding and borrowing, and they were also to be permitted to retain an adequate margin in their loan business.

A major departure in the procedure¹ the Action Programme was to fix the repaying capacity of each cultivator at half the estimated total cash income of the member minus the known demands on account of other loans taken by him. The cash income was to

-
1. The crop loan scheme, which was being followed in Maharashtra and Gujarat had evolved a scheme of finance for each crop shown in the district at the annual field workers' conference the preparation of statements indicating credit needs of each member on the basis of his acreage under different crops, sanction of a credit limit for each society by the Central Bank ; disbursement of the loan in cash and in kind to the member during the cultivation season ; and the fixation of loan recovery dates to coincide with harvesting periods.

include estimated cash realization from sale of the produce and other income outside the farm. The credit to be provided to the cultivator for raising the crop was assumed to consist of (i) the cash requirements for production fixed on a per acre basis (crop-wise) to be about one-fourth of the average value of gross produce in dry areas and one-third in irrigated areas ; (ii) requirements in kind for fertilizers, seeds, pesticides, etc., (iii) each requirement for extra labour charges involved in the application of these inputs which should not exceed half the value of inputs : (iv) a lump sum cash loan of Rs. 50 per family to meet consumption expenditure ; and (v) a cash loan equivalent to 5% of the produce sold by the member through the co-operative marketing society during the previous year as an incentive to further use of the co-operative marketing structure. Where the needs exceeded the repaying capacity of the member the cut in the credit for which he was eligible would be made in items other than in items (ii) and (iii).

Important modifications in the loaning procedure were rendered necessary as a result of discussions with the cooperatives and State Government officials in different States. These were included in a Crop Loan Manual, released by the Reserve Bank of India. The major modification was that the repaying capacity of a cultivator should be related only to the value of the gross produce from his land in view of the difficulty of correctly estimating his non-farm income. Further, a traditional cultivator's normal repaying capacity could be fixed at about one-third of the value of his gross produce from agriculture. As only small farmers ordinarily need credit for maintenance expenses and as such farmers, cultivating the land themselves, do not incur labour charges, the amount advanced (one-third of the value of gross produce) was considered sufficient to meet their cash needs for consumption and other needs.

Three-Component Formula

Under the Crop loan system the credit needs of the cultivator are to be determined and fixed on the basis of his crop, the proposed area to be cultivated and the scale of finance fixed for the crop. Credit is to be provided partly in cash and partly in kind on the basis of three components :

(a) *A cash component* to take care of the outlay on cultivation according to the traditional methods. This cash component is not to exceed one-third of the average value of gross produce per acre and is to be disbursed as soon as cultivation operations commence ;

(b) *A kind component* to include inputs like fertilizers, pesticides, agricultural implements for improved cultivation ;

(c) *A further component in cash* for taking care of the likely additional cash outlay on account of use of inputs which is not to exceed half the value of kind inputs and is to be availed of soon after the kind component is taken by the cultivator.

The three-component formula was, thus, expected to possess the flexibility needed to meet the requirements of farmers adopting improved practices in varying degrees. The first cash component provides adequate credit to those who carry on cultivation in a traditional manner. To those who wished to use improved methods, the second and third components are to be provided and the application of such inputs could be expected to generate their own repaying capacity. The extent to which credit could be provided under these two components would depend on the extent to which the cultivator is prepared to use fertilizers and insecticides subject to the ceiling amount prescribed. The limit of repaying capacity has been taken to be roughly half the value of his total yield from the harvest, of which one-third could be the limit for short-term loans, the remaining one-sixth being the repaying capacity for instalment due under a medium-term loan.

Salient Features of the System

The salient features of the crop loan system are.

(i) The credit requirements of the cultivators are to be assessed on the basis of the acreage and cost of cultivation of the crops grown, subject to the repaying capacity.

(ii) This system is intended to ensure that cultivators are given loans with reference to their production requirements in cash and kind ; on cultivator is denied loan because he does not use fertilizers.

(iii) The size of the loans is to be determined by the rational assessment of the needs in relation to the production activity undertaken by the agriculturists.

(iv) The crop loans are to be repaid out of the sale proceeds of such crops. As such, the sales are generally effected through an agency with which the credit society is linked.

(v) The advances are generally confined to the period shortly before sowing and ending shortly before the harvest. During the season a cultivator may be helped to meet the cost of seed, fertilizers, weeding, harvesting, etc.

(vi) The eligibility of a cultivator to loan and the size of the loan are determined not by the fact of ownership of land or by the value of tangible security that he can offer, but by the fact that (a) he is a *bonafide* cultivator, (b) he is in need of credit for undertaking production ; and (c) that he is able to pay the loan out of his production.

(vii) The eligibility for medium term loan for a member is determined on a per acre, per crop, per annual repayment instalment basis.

In brief, the intention of the crop loan system is that the entire credit system should be 'production-based' and 'market-oriented.' The emphasis is on 'productive needs' and 'productive uses' as criteria for the issue of loans.

Evaluation of the Crop Loan System

The system has been in vogue for the last 12 years. It has been introduced to make co-operative credit production oriented and to ensure timely flow of credit to small farmers by liberalising the loaning policies and procedures. The various field investigations in selected districts conducted for the All-India Rural Credit Review Committee have revealed a considerable divergence between the accepted principle and the actual practices. Some of the important observations are :

(1) In many cases the scales of finance did not conform to the three-component formula ; the disbursement of the loan in kind was negligible, seasonality in lending and recovery was not being observed, and the mortgage of land was still being insisted upon as security for short-term production loans.

(2) The crop disbursement authorities are facing a number of difficulties in distributing the loan in kind, because : (a) the members were unwilling to lift fertilizers ; (b) the agricultural requisites did not reach the farmers in adequate quantities and in time ; (c) there was a lack of co-ordination between the co-operative credit agency and those in charge of the distribution of fertilizers.

(3) The principle of seasonality in lending and recovery of loans has not been fully implemented in practice. For example, in Tamil Nadu, while seasonality pattern was being observed in the issue of loans, the dates for repayment were usually not being fixed with reference to the harvesting season. In states like Assam and M. P., the due dates for loans corresponded to the harvesting seasons, but loans were normally issued throughout the year. In Orissa, Punjab, Rajasthan, seasonality had not so far been adopted by the credit banks.

(4) The principle that crop loans should be provided on personal security and a statutory charge on the crop has not been properly implemented in most states and loans against personal security are subject to ceilings fixed at very low levels beyond which mortgage is insisted upon. In some states the persons standing as securities are required to be land owners. In Assam, Bihar, Orissa and W. Bengal, loans upto Rs. 500 are provided against personal securities but larger loans required mortgage of land. Even in comparatively advanced states like Punjab and Tamil Nadu eligibility of credit is largely determined directly or indirectly by the value of assets owned.

(5) The crop loan system has also not been fully implemented on account of ineffective linking of credit with marketing. Though

in most states, agricultural credit societies do secure agreements that the members would sell their produce through the marketing societies, in practice such agreements are not taken seriously either by the members who sign them or the credit societies who take them. This is due to the fact that credit societies have not adequately appreciated the importance of co-operative marketing and that they feel that marketable surplus would be negligible in the case of many small producers.

(6) Procedural delay in application for loans, scrutiny and verification of particulars, sanction and in dispensation of credit is yet the accepted practice.

Weaknesses of the System

While the assessment of the repaying capacity of the borrower may be subject to errors of judgment and may be based on insufficient or unreliable data the method of determining it as a specific proportion of the value of the gross output also suffers from the drawback that it might result in providing less credit to the small cultivators and more credit to the large cultivator than what is actually required by either. This is so because the requirement of credit which should bear some relation to the cost of cultivation is assessed in terms of repaying capacity related to the size of the farm. The small cultivator may require more credit than his repaying capacity and the large cultivator may not require credit upto the limit of his repaying capacity. The small cultivator will be required to meet his need from off-farm income, while the large cultivator's credit provision will be limited by the individual maximum borrowing power fixed by the society. Therefore, fixation of credit requirements, on the basis of repaying capacity, may not lead to any undue discrimination in favour of the larger cultivator.

Secondly, another serious limitation of the method is that in a period of abnormal rise in farm prices the requirement of credit computed at one-third of the value of gross output may be pitched very high as compared to actual needs. This will have to be corrected. Similarly, any steep fall in farm prices in a year should not result in a corresponding fall in credit needs. The scale of finance may be diminished to the extent that cultivators costs have declined. Ordinarily, the first cash component, which is to be used mainly for payment of labour by the large cultivator and to meet the maintenance needs by the small cultivator should be expected to vary in proportion to the rise or fall in prices. It will be a good plan to keep the first component constant from year to year and allow variation only in the second and third components.

Thirdly, it should not be assumed that current cultivation practices are fully of the traditional type, because with the popularisation of fertilizers and fertilizer mixtures, farmers have adopted some improved practices ; and further, the pattern of cropping was also changed owing to conversion of a dry area into an irrigated land. Therefore, these factors need be taken into consideration while

estimating the gross value of output when cultivation is carried out in the traditional manner.

Fourthly, seasonality in disbursement and recovery of loans as an integral part of the crop loan scheme presents some problems when applied to areas sown more than once. There are also areas where cultivation is continuous throughout the year and the accommodation from the society may have to be in the form of a cash credit. While a maximum credit limit which may be drawn by a cultivator can be sanctioned by the society, there might be cases where the farmer is not in a position to indicate sufficiently in advance the area which he proposes to cultivate during the second and third crops. Even where this is definitely known the actual area cultivated may be different from what was declared by him depending upon the availability of water or the onset of rains. Considerable organisational competence has to be developed at the society level to regulate disbursement in accordance with the actual area under cultivation for the second or third crops.

Fifthly, where the cultivator grows a variety of crops during the same agricultural season it may be necessary to fix the recovery date to coincide with the harvesting period of the most important crop cultivated. Thus, where the cultivator grows both cash and food crops repayment may be fixed to suit the harvesting period of the cash crop. Where the land is cultivated more than once during the same year, the recoveries will have to coincide with the harvesting season of each of the crops or with the harvesting period of the cash crop or that whose yield is the highest. It would be difficult to lay down any rigid pattern of seasonality for recoveries in areas which exhibit considerable heterogeneity in cropping patterns.

Finally, as no effective linking of credit with marketing has yet been established, the Crop Loan Manual suggested that the Field Workers' Conference should fix in each year an increasing proportion of the credit issued to be recovered by sale of produce through the marketing society in the area. This would depend upon the quality of service which marketing societies can render and also on ready availability of market intelligence, adequate transport, storage and warehousing facilities, contact with terminal markets, and the ability to offer a competitive price. Societies offering such services will have to agree to withhold at least half the value of the produce in the case of outright purchase and two-third of the value of the produce in the case of a pledge loan or when an advance payment is made towards the credit society's dues. Where the marketing society is unable to offer these services, the credit society recovery performance would depend entirely on the members' loyalty and his continuing need for credit and other service facilities from the society.

Suggestions for Improvement

In order to make the crop loan scheme a success, certain principles need to be strictly followed.

First, a defaulting member of a primary agricultural credit society should not be financed again until his arrears are cleared. However, the Action Programme recommended that where a member has cleared his dues to the extent of 80 per cent and is unable to pay the balance because of crop failure on account of natural calamities in the area, he may be financed again, even before the usual investigations for purposes of granting an extension are undertaken.

At present, the District Co-operative Banks do not generally sanction loans to a society which has not cleared 65 per cent of its dues to the bank. When a society is denied credit on the basis of its overall performance, it results in its non-defaulting members also being deprived of credit on account of other members not paying up in time. Therefore, there is a need to stipulate a level of overdues which may not be exceeded by each primary agricultural credit society the level should be fixed that it should not cause hardship to the large majority of members. In view of this consideration, the Action Programme recommended that a society should be considered as being eligible for fresh finance only after it has cleared upto 50 to 75 per cent of its dues, the level to be fixed by each district bank depending on the conditions in its area. In areas affected by natural calamity the district bank may relax this condition and allow societies which have cleared even one-third of their dues to be refinanced, but the fresh finance should be only in respect of members whose overdues do not exceed 20 per cent and where there is a proposal to grant them extensions for the balance amount.

Second, timeliness of credit is considered to be of crucial importance in the crop loan system. To ensure this, the procedural formalities should be kept to the minimum, consistent with the need to ensure that the quantum of credit provided is not excessive in relation to needs and repaying capacity and that the funds are used for productive purposes.

In brief, in order to make necessary impact on agricultural production, it is necessary that there should be whole-hearted and systematic implementation of the Crop loan system in all its aspects such as those related to security, adequacy and the arrangement for recovery of loans. Serious efforts should be made to eliminate those features of the current practice which inhibit the flow of credit to the agriculturists.

THE RURAL ELECTRIFICATION CORPORATION

The Rural Electrification Corporation was set up in July 1969 to extend financial assistance to the State electricity board, rural electric co-operative societies and State governments for rural electrification projects. It became a public limited company in July 1975.

The Corporation's financing policy is project-based and oriented to area development, in tune with its basic approach. The main categories of loans are as follows :

- (1) Mini Industrial Estates Loans (MES) : These loans aim at electrification of industrial estates, industrial development areas in villages, small towns and semi urban areas with a population not exceeding 20,000. The loan is limited to Rs. 15 lakh.
- (i) Mini Industrial Estates Loans : These loans are available where single wire earth return system is adopted in rural areas as the system results in appreciable economy in project costs. The individual costs vary between Rs. 5 to Rs. 10 lakh.
- (iii) Mini Farm (Lift Irrigation) Loans: Assistance to lift irrigation and tubewell programmes of State governments, State sponsored corporations and co-operative societies falls under this category. The amount of loan for an individual project is limited to Rs. 25 lakh.
- (iv) Special Loans : These are meant to improve the quality of rural electrification distribution.

The last two categories of loans were created during the year 1976-77. The total financial assistance sanctioned by the corporation from its inception up to the end of March 1977 aggregated Rs. 674 crores. But the cumulative disbursements amounted to only Rs. 404.2 crore. Of this, direct loans amounted to Rs. 402.1 crore, subscription to debentures to Rs. 2.1 crore and grants to Rs. 0.03 crore. The bulk of the sanctioned loans at Rs. 384 crore went to the State electricity boards. Projectwise loans amounted to Rs. 336.6 crore.

The corporation has sanctioned 1522 rural electrification projects up to the end of March 1977. These cover electrification of 98109 new villages besides additional connections in 21592 already electrified villages. They included service connections to 851823 agricultural pumpsets, 132817 small industries, 3127477 domestic and commercial consumers and 5518202 street lights.

During the year 12310 new villages were electrified under the projects financed by REC, compared to 8093 villages during the previous year. The total number of service connections provided during the year was 348302 which included 75523 pumpsets, 7597 small industries, 222982 domestic and commercial services and 42200 street light points. This showed an appreciable improvement upon the last year's performance of 43367 pumpsets, 5207 small industries 140428 domestic and commercial connections and 28070 street light points for the previous year.

The construction work completed during the year 1976-77 comprised of 21723 km of HT lines, 42297 km of LT lines and distri-

bution transformers of 828482 kva capacity as compared to 15743 kms of HT lines, 18912 kms of LT lines and transformers of 470361 kva capacity in the previous year.

The total number of new villages electrified under the projects financed by REC stood at 39786. The total number of service connections provided were 1043760, including 226603 pumpsets, 22695 small industries, 615114 domestic and commercial services, 174813 street lights and 535 other connections. As compared to the previous year, the number of new villages electrified increased by 45 per cent and the number of service connections by 50 per cent.

Although the working during the year 1976-77 showed a marked improvement over the previous year, the cumulative performance of the corporation falls far short of the targets set earlier.

The study of the performance of disbursements shows that up to the end of March 1977, as compared with the phased targets corresponding to the loan instalments drawn up to the end of September 1976 were electrification of new villages 83 per cent, energisation of pumpsets 56 per cent, small industries 37 per cent, domestic and commercial services 45 per cent, and street light 69 per cent. As far as the construction work was concerned, the performance were 93 per cent for HT lines, 77 per cent for LT lines and 78 per cent for distribution transformers.

Since the beginning of 1977-78 and up to the end of July 1977 the corporation approved 53 rural electrification projects involving a loan of Rs. 18.92 crore. Thus 53 projects, envisage electrification of 2847 villages and provision of service connections in respect of 20837 agricultural pumpsets, 1,980 small industries, 42619 domestic and commercial connections and 19931 street light points.

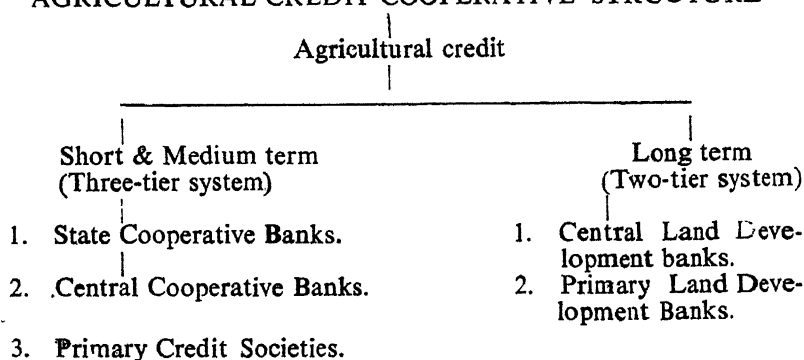
17.

Primary Cooperative Credit Societies

Three-Tier Structure

The co-operative credit structure in India consists of two parts, one engaged in short and medium-term credit and the other in long-term credit. The former, in each State, is a three-tier structure. The primary agricultural credit societies at the village form the base. It is on this that the whole edifice of co-operative credit is based. They federate into central co-operative banks, usually at the district level. At the State level these are federated into an Apex bank serving an entire state. The apex bank in its turn is closely linked with the Reserve Bank of India. The long-term credit is provided by a Central Land Development Bank for each State at the apex level. The apex banks operate in some cases through Primary Land Development Banks, each serving an area of a taluka or district, and where there do not exist land development banks, through its own branches or central co-operative banks.

AGRICULTURAL CREDIT COOPERATIVE STRUCTURE



Thus, it will be seen that co-operative credit structure is a type of pyramid, the broad base of which is represented by the primary societies at the village level. At the top are the Apex societies at

the State level and between these two are found the Central societies.¹ These different societies are confined to villages, the State and the taluka or district head quarters respectively. If the borrower in a village needs credit, he applies to the society. If the society has no funds at its disposal it applies to the central bank and if the central bank is in need of funds it applies to the State Bank. That is why it is said that the co-operative movement links the farmer in the remote villages with the money market of the country. Together these institutions constitute an effective machinery functioning as balancing centres within the movement and supplementing the internal financial resources by borrowing from outside. They, thus, assist in supplying agricultural credit in the quantity required, supervise its use and effect its recovery on due dates. The fact that the structure is federal in character and that the institutions at the different levels are independent legal entities, it also implies that the strength of the chain depends upon the strength of each of the links.²

The Study Group of the National Credit Council (headed by Dr. Gadgil) has stated : "The co-operative banking system is an integrated one and, because of its three-tier structure, has been enabled to extend credit to agriculturists, artisans etc. The three-tier system also allows a rationalised flow of resources from the metropolitan centres to villages and combines this with fairly low costs of operations."

1. PRIMARY AGRICULTURAL CREDIT SOCIETIES

At the operational level, there exists a primary co-operative society to extend credit to the farmer. This unit epitomizes the vitality and service potential of the co-operative movement in the country. They are the kernel of the co-operative movement in India and constitute the largest number of co-operative institutions. These societies were originally formed on Raiffeisen model, though recently there has been certain important deviations from the Raiffeisen principles, which were a restricted area of operation, unlimited liability, gratuitous management and permanent indivisible reserve fund. Now the deviations relate to liability, area of operation, honorary management and participation of the government in the society as a shareholder. These deviations have been regarded as revolutionary.³

The organisation of these societies dates back to 1904 when the first Co-operative Societies Act was passed. These societies were started with the object of providing cheap credit to the agriculturists

-
1. It would be interesting to note that there is a three-tiered structure in India, Pakistan and Japan : on the other hand, a two-tiered Co-operative structure exists in Ceylon, Taiwan, Korea, Republic of Vietnam and Thailand.
 2. *Report of the Committee on Co-operative Credit*, 1960, p. 37.
 3. Darling, Malcolm, *Report on Certain Aspects of Co-operative Movement in India*, p. 8.

in order to free them from the clutches of the rapacious moneylenders. These societies are the *raison d'être* of the state and central banks and as the Townsend Committee put it "the agricultural primary credit society is the foundation stone on which the whole co-operative edifice is built."

(1) Thus, these Primaries are the institutions which have direct contact with the agriculturists who are their members and for whom these are mainly organised.

(2) They are organised and managed by the member farmers for their own benefit.

(3) Though cooperative movement consists of different types of societies, it is these primaries that form the bulk. This will be clear from the following table.

All Types of Cooperatives & Primary Agricultural Credit Societies

	1950-51	1955-56	1960-61	1971-72	1973-74	1974-75	1975-76
No. of all types of societies (Lakhs).	1.8	2.4	3.3	3.2	3.3	3.3	3.1
No. of primary agricultural credit societies (Lakhs).	1.05	1.60	2.12	1.58	1.56	1.53	1.35
Percentage of primaries to total.	61.1	66.6	63.8	50.0	46.8	66.6	33.3
Membership of all types of societies. (Lakhs).	137	176	342	614	692	695	742
Membership of primary societies (Lakhs).	44.1	77.9	170.4	320.1	349.5	364.4	395.2
Percentage of membership of primaries to total.	32.1	44.3	49.7	54.1	40.5	52.6	52.2

It may, therefore, be said that these primaries are important of all other cooperative societies and the success of the entire cooperative movement in general and credit structure in particular depends, to a very large extent, on the success of these primaries.

Functions of Primary Credit Societies

The main functions of the credit societies are to provide short- and medium-term credit ; supply agricultural and other production requirements and undertake marketing of agricultural produce. In addition to these, the cooperatives help in formulating and implementing a plan for agricultural production for the village and undertake such educative, advisory and welfare functions as the members might be willing to take up. The societies are also expected to inculcate the habit of thrift and saving among their members.

According to the *Committee on Cooperative Credit* (1960) the credit society should render certain services and correspondingly discharge certain obligations. Among the more important of these are the following :¹

- (1) *to associate itself with programme of production ;*
- (2) *to lend adequate amount to members for their agricultural and consumption purposes limited to their paying capacity.*
- (3) *to borrow adequate funds from the central financial agencies for helping the members adequately for the above purposes;*
- (4) *to attract local savings for share capital and fixed deposits;*
- (5) *to supervise use of loans (especially medium-term loans) and to see that they are paid punctually.*
- (6) *to distribute fertilisers, seeds, insecticides, agricultural implements etc. either on its own behalf or as agent ;*
- (7) *to supply certain consumer goods in common demand such as kerosene, sugar etc.*
- (8) *to store the produce of the members till it is sold;*
- (9) *to collect or purchase produce, where necessary, on behalf of a consumer's society, marketing society or government ; and*
- (10) *to associate itself with programmes of economic and social welfare, for the village.*

Thus, the primary credit society is intended to promote the economic interests of its members in accordance with the co-operative principles and this aim is achieved by activities in different directions such as promoting savings among members, providing loans to them, supplying them with agricultural requisites and domestic requirements and arranging for the marketing of their agricultural produce. For this purpose the single-purpose societies have yielded place to multipurpose societies..

In attempting to choose the most suitable type of co-operative, five points are generally taken into consideration. *First*, the need to change the character of credit from static to dynamic by combining it with advice or improvement of productivity and by arranging for the supply of needed agricultural requisite. *Second*, the need to assist the farmer to secure a better price for his produce by improving his bargaining power. *Third*, arrangement has to be made to assist the farmer in obtaining supplies of essential goods at reasonable prices. *Fourth*, repayment of loans must be ensured preferably through sale proceeds of the crops, and *finally*, the volume of business handled by a co-operative has to be adequate enough to ensure its viability.

In view of these and other considerations, in all developing countries, the multi-purpose societies are favoured as against the single purpose society.

1. *Report*, pp. 72-73.

Management aspects

The ultimate authority in the affairs of a society is the general body of members which should meet at least once a year. However, to look after the day-to-day working, the general body elects a small managing committee which consists of, say, five to nine members and elects its own president and secretary. All these office bearers usually render honorary service, except that an honorarium out of the profits may be paid to the president or secretary in certain cases. Societies whose transactions are heavy appoint a clerk to maintain accounts who is paid a monthly salary.

The *All India Rural Credit Survey Committee* had recommended the reorganisation of primary rural credit society so as to cover a group of villages with a reasonably large membership and a reasonably adequate share capital so as to provide it with adequate business. The *Committee on Co-operative Credit* said that, "A co-operative credit society cannot afford to enlarge itself into an impersonal institution. Therefore, the membership must not be too large and the area of operation of the society should be compact. Mutual contact and knowledge are best secured in one village, especially where the village is not very large. But, even if the village is large (with a population of 4,000 to 5,000), there should be one society for the village. No village included in a society should be at a distance of more than three or four miles from the headquarter village. The maximum number of families that should be covered should be 600 families or about 3,000 population."¹

The *All-India Rural Credit Review Committee* recommended that an agricultural credit society may be permitted to cover a population of more than 3,000, and that no limit be set in this regard. as regards the restriction on the distance of a village to the society's headquarters, the Committee felt that it should be permissible to vary it from state to state as conditions differ widely both in respect of agricultural potential and availability of communications.²

The N. D. C. Resolution (of 9th Nov., 1958) laid down the pattern of organisation at the primary level, viz., a society for each village. If villages are small two or more of them can, with the consent of the communities concerned, be joined together to form one society provided the population covered does not exceed about 1,000.

It is worth noting that the coverage of villages by these societies increased from 75 per cent in 1960-61 to 1965-66, to 92 per cent in 1968-69, to 95 per cent in 1973-74, and 97 per cent in 1976-77. In terms of coverage of rural population, the increase was from 24 per cent to 33 per cent, to 34 per cent, to 42 per cent and 47 per cent

1. *Report*, p. 75.

2. *Rport*, 1969, p. 456.

respectively while the coverage of agricultural population increased from 30 per cent to 40 per cent, to 43 per cent, to 45 per cent and 48 per cent during the same period.

It may, however, be observed that as yet the bulk of rural population is outside the orbit of the co-operative movement. (Appendix 1)

Membership

The membership is open for agriculturists, artisans and small traders in the villages. The minimum initial membership is 10 and ultimately it may be moderate (50 or so). The coverage of rural population increased from 7 per cent in 1950-51 to 24 per cent in 1960-61 and to 47 per cent in 1976-77. The coverage of agricultural population has also been significant. It was 7 per cent in 1950-51. It increased to 30 per cent in 1960-61, to 48 per cent in 1976-77. The coverage of rural population was highest in H. P. (84) followed by Punjab (76). Lowest was in Assam (15) and West Bengal (18). Other States with good average (above the national average of 47 %) were : Karnataka (47), Tamilnadu (76), U. P. (51), Maharashtra (67), and Kerala (59). It may be observed that as yet the bulk of the rural population is outside the orbit of the Co-operatives. The coverage can be extended if co-operative extension activities are intensified through development of educational programmes in the rural areas.

Universal membership has now been accepted as the policy so that the weaker section could become members of the co-operatives and avail of its services. The co-operative law of the states of Andhra Pradesh, Bihar, Haryana, Karnataka, Rajasthan, U. P. and West Bengal have been amended to provide for automatic membership to eligible persons from the date of their making application for membership.

The average membership per society was 338 in 1976-77 as against 236 in 1973-74, 80 in 1960-61, and 45 in 1950-51. Many of the societies are financially non-viable because of this low membership.

Liability

Initially these societies have unlimited liability, for in the words of *The Edward MacLagan Committee*, "the unlimited liability constitutes an important factor in the confidence reposed in societies both by the central institutions inside the movement and by the joint stock banks outside it." The unlimited liability carries with it two-fold advantages. *First*, it exercises an educational influence on the members by stimulating mutual control and supervision. *Second*, it improves credit of the society by inspiring confidence among its outside members. But it has the disadvantage inasmuch as the non-borrowing members are liable to pay the dues of the society in the

event of default by the borrowing members.¹ In the opinion of the *Saraiya Committee*, the unlimited liability has not been very helpful to the progress of co-operative credit. Responsible persons were kept off the movement and also it was largely illusory as long as there was no bar on the alienation of property by members. It was of the view that "except where unlimited liability has produced good results the liability of the reformed and reorganised primary society should be limited."²

The *Rural Credit Committee* advocated the formation of large-sized societies with limited liability. So also did the *Working Group on Co-operative Policy*. The *All-India Rural Credit Review Committee*, pointed out that "unlimited liability operates as a restraint on the willingness of the society to liberalise its loan policies, to admit new members and to extend its area of operations. It also presents some difficulty if the society is to receive contribution from the State Governments whose liability, has to be limited". In view of these observations there has been a shift from unlimited liability towards limited liability or conversion of existing unlimited liability societies into limited liability societies. The proportion of societies with limited liability which was only 27 in 1950-51, moved to 41 in 1955-56, to 60 in 1960-61, to 70 in 1965-66, to 75 in 1973-74, and to 78 in 1976-77.

-
1. Co-operative opinion has been divided on the question of limited or unlimited liability for agricultural credit societies. The adherents cite hardship which the enforcement of unlimited liability imposes upon the members and claim that unlimited liability is unsuited to the many places where members from more than one village are necessary for the economical working of a society and moreover, that it frightens off prospective members of means who can be assets.

Those who claim for the continuance of unlimited liability say that credit will be confined to those who can provide immovable security, thus cutting off the very large number whose assets are honesty and their potential earning capacity and also that it would remove a necessary check upon the extravagant borrowing and unproductive use of loan—Horace Plunket Foundation, *Year Book of Agricultural Co-operation*, 1948, p. 157; *Report of the Agricultural Finance Sub-Committee*, p. 85.

The *Gadgil Committee* recommended unlimited liability for credit societies as a rule, while allowing an exception if limited liability was proved to attract valuable element to the movement in any region, provided that a substantial part of the funds required could be raised through the share capital. The liability in such a case would be limited to the value of the share or a multiple of it.

The Reserve Bank of India recommended two distinct types of agencies, one an agricultural bank with limited liability covering several villages and lending to the more prosperous cultivators on ordinary business lines against property or other real security and the other a Raiffeisen society with unlimited liability and a limited area, working as a unit for the economic and social rehabilitation of a poor, indebted and backward population,—*Review of the Co-operation Movement in India*, 1939-40, p. 26.

2. *Report of the Co-operative Planning Committee*, pp. 22-23.

A significant development in the direction of organising primary societies on the basis of a limited liability with enlarged functions was the programme of establishing large-sized societies on the lines recommended by the Rural Credit Survey Committee. It said "a large size society should have the following characteristics :

- (i) It should have an adequate volume of business ;
- (ii) It should have an adequate capital base so that it can have sufficient borrowing power ;
- (iii) It should employ a fully trained and competent wholetime paid secretary who would attend to its work efficiently.

Share Capital

The share capital provides an important part of the working capital of the village co-operative societies in Maharashtra, W. Bengal, Gujarat, M.P., Tamil Nadu, Karnataka, Punjab, Kerala Andhra Pradesh and Rajasthan, as would be evidenced from the table given below :

Financial Resources of Primary Agricultural Credit Societies.

State/UTs	Share capital		Deposits		(Amounts in Rs. lakhs)	
	1973-74	1976-77	1973-74	1976-77	Working capital 1973-74	1976-77
Andhra Pradesh	1128	1553	420	545	7527	12273
Gujarat	3159	4425	679	823	19910	28775
Karnataka	1742	2310	391	665	9392	15327
Kerala	1350	1460	1443	2144	7170	10838
Madhya Pradesh	2282	2677	546	728	14201	17365
Maharashtra	5903	7543	722	745	25916	33065
Punjab	1473	1711	2096	2318	9417	10544
Rajasthan	1017	1966	201	338	5365	10828
Tamil Nadu	1835	3044	666	990	9627	25882
Uttar Pradesh	3183	4416	557	1070	15534	16225
Total All-India :	26206	34991	9026	11935	146366	207111

(Source : *Annual Report of the Ministry of Industry and Civil Supplies*, Department of Co-operation for 1974-75, pp. 395-396 ; and *Report of the Department of Rural Development for 1977-78*, pp. 140-41.

The share capital of a society is divided into units called *shares*, contributed by those members, the ownership of which determines the rights and obligations of the holder of the society and its creditors. These are of small value, commonly Rs. 10 and 50 each and are payable in half yearly or annual instalments, sometimes withdrawable decennially with payment of dividends after the expiration of deposit period to a maximum rate fixed under the rules or bye-laws.¹

The primary societies issue only ordinary shares to their members. In the case of 'unlimited liability societies', the values of

1. Mehta, V. L., *Origin and Growth of Co-operation in India*, p. 7.

shares used to be very small, but now emphasis is being laid on raising sufficient share capital to provide a strong financial base for various reasons such as :

(a) The primary credit society requires large resources for meeting the requirements of the members. Simultaneously, the members have also certain responsibility towards the society which is based on the principle of '*mutual help and self-help*', therefore, every member has to fulfil that obligation.

(b) The share capital held by a member is the measure of his stake/interest in the financial stability and soundness of the society ; and it is also a measure of attachment that member has with a society.

(c) The larger the share capital, contributed by the member, the more is the interest that he takes in the affairs of the society.

(d) It goes a long way in creating a sense of responsibility and fostering loyalty among the members. So far as the society is concerned it is able to contribute adequate funds to the share capital of the higher federal institutions.

(e) A strong share capital base inspires greater confidence among the creditors and reduces reliance on outside funds.

(f) It also marks the beginning of '*thrift*' which is the self generating force of finance in the field of cooperative banking.

(g) A strong share capital base also acts as a shock-absorbing cushion so that the shock of over-dues is absorbed and the liquidity and the financial stability of institutions are not affected.

However, it may be noted that certain cultivators may not be able to contribute their share all at once. Hence, the primary credit societies may need to raise funds from outside sources to meet the necessary requirements of the members. In this connection, the All India Rural Credit Survey Committee and the V.L. Mehta Committee have recommended that Government should contribute to the share capital of the credit societies, indirectly at the primary level and directly at the secondary level. The contribution of the State towards the share capital of the primary societies will depend on these considerations : (i) the extent of the partnership ; (ii) the duration of the partnership ; (iii) the financial obligations of partnership in the society ; (iv) the state control over the society's management ; and (v) whether it should be direct or indirect.

The A.I.R.C.S. Committee suggested 51 p.c. state contribution on a matching basis. While the V.L. Mehta Committee suggested that the range of this contribution should be between Rs. 1,000/- and Rs. 10,000/-, the duration will depend upon the circumstances of the institutions and the area. The Government will have the same rights, privileges and obligations as are available to other share holders. States' nominees to the Board of Management shall not exceed one-third of the total strength.

The following table gives the progress of agricureal credit societies with special reference to raising of funds.

Progress of Primary Agricultural Credit Societies

	Pre I plan yr. (50-51)	Pre II plan yr. (55-56)	Pre III plan yr. (60-61)	(65-66)	Pre IV plan yr. (68-69)	73-74	74-75	75-76	76-77 (P)
1. No. of societies (lakhs.)	1.05	1.60	2.12	1.94	1.68	1.54	1.53	1.35	1.23
2. Percentage of villages covered.	N.A.	N.A.	75	90	92	95	95	97	97
3. Membership (Nos. in lakhs)	44.08	77.91	170.41	266.23	291.73	349.56	364.42	395.21	415.17
4. Percentage of rural population covered (estimated).	7	12	24	33	34	41	41	45	47
5. Share capital (Rs. crores)									
(a) Total	7.61	16.80	57.75	116.24	167.31	271.06	296.39	327.71	349.41
(b) Govt. contribution.	N.A.	0.58	5.71	35.32	13.30	28.98	31.40	35.09	89.33
6. Deposits (Rs. crores)	5.26	7.04	14.59	...	56.84	89.28	101.05	113.31	119.35
7. Working capital (Rs. crores)	37.25	79.10	273.92	345.50	812.22	1580.28	1801.48	1989.70	2071.11
8. Loans advanced (Rs. crores)									
(a) Total.	22.90	49.62	202.75	503.97	47.48	700.46	900.82	1204.35	1153.35
(b) Medium term.	N.A.	13.46	19.93	...	...	71.15	118.23	105.16	121.40
9. Loans overdue									
(a) Total (Rs. crores)	6.38	14.96	44.30	...	214.04	443.24	503.39	560.51	611.78
(b) Loans overdue as percentage of loans outstanding.	22	25	20	...	35	42	43	43	42
10. Average per society									
(a) Membership (Nos.)	45	49	80	137	174	227	239	293	338
(b) Share capital (Nos.)	727	1051	2722	5996	9973	17623	19407	24245	28490
(c) Deposits. (Rs.)	408	441	688	1822	3388	5805	6619	8393	9718
(d) Loans advanced.	1983	3102	9558	17770	30041	49443	59004	75811	93908
11. Average per member (Rs.)									
(a) Share capital.	17	22	34	44	57	78	81	83	84
(b) Deposits.	10	9	9	13	19	26	28	29	28
(c) Loans advanced.	44	64	119	124	172	281	247	259	278

* Relates to 1956-57.

@ Relates to 1957-58.

** Includes gross advances under cash credit and overdrafts.

(Source : *Annual Report of the Ministry of Industrial and Civil Supplies* Department of Cooperation for 1974-75, p. 392; and *Annual Report of the Department of Rural Development* for 1977-78, pp. 138-139).

The average share capital per society was only Rs. 727/- in 1950-51. It increased to Rs. 24,245/- in 1975-76 and to Rs. 28,490/- in 1976-77. The average share capital per society was the highest in Kerala (Rs. 84,344) and lowest in Manipur (Rs. 3044). In Maharashtra it was Rs. 39,882.

From the table it will be gathered that not only the amount of share capital has been on increase (from Rs. 7.61 crores in 1950-51 to Rs. 167.31 crores in 1968-69 to Rs. 349.91 crores in 1976-77) but the contribution of the Government to it has also shown a good progress (from Rs. Nil in 1950-51 to Rs. 13.03 crores in 1968-69, to Rs. 89.38 crores in 1976-77. The working capital also increased from Rs. 37.25 crores to Rs. 812.22 crores and to Rs. 2071.11 crores during the same period. It is of interest to note that about 90 per cent of the share capital is raised by the primaries themselves.

Sources of Capital

1. **Entrance Fees.** Entrance fees charged on the admission of members provide only a very minor proportion of the working capital and serve merely to cover the preliminary expenses. Generally Re. one is charged as an admission fee from members.

2. **Deposits.** These are the second line of weapons to strengthen the armoury of capital structure of a cooperative society. The societies mobilize deposits from their members. These are the real test of cooperation, yet are very small, though efforts have been made to foster such deposits. Obligatory deposits are found in Bihar and Orissa, while in Maharashtra in most societies the members are required to deposit for 5 to 10 years, 5 to 10 p. c. of the loan advanced. Some societies have tried to encourage saving by members by provision of home savings boxes, e. g., in West Bengal, while others by their bye-laws require each member to deposit a specified portion of the annual produce. But the results have been very disappointing.

Village credit societies can accept deposits from non-members also and the amount of non-member deposits a society is able to secure can be taken as a fair measure of success in calculating thrift and winning the confidence of the local public. But local deposits form only a small part of the total working capital of the village credit societies. This is partly due to the poverty of the rural masses, and partly to the greater profitability of money lending, and partly to the recent tendency to discourage the acceptance of non-member deposits by such societies in order to centralise all their borrowing in the district Central Bank and thus facilitate supervision. Uneconomic holdings, scanty rainfall, lack of irrigation facilities, primitive techniques of production restrict the farmers to squeeze a surplus from their normal deficit budget.

Though the total deposits of these societies increased from Rs. 4.26 crores in 1950-51 to Rs. 14.59 crores in 1960-61 and to Rs.

56.84 crores in 1968-69 and to Rs. 119.35 crores in 1976-77 yet the proportion of the deposits to the total working capital, during this period fell from 10.9 to 7.0 to 5.7 between 1950-51, 1968-69 and 1976-77. The average deposits per society ranged from Rs. 123859 in Kerala to Rs. 1461 in West Bengal and Rs. 3939 in Maharashtra.

To increase deposits the *Action Programme for Cooperative Credit* recommended that after a member's shareholding in society reached the limit to 20% of borrowings, the society may collect thrift deposits at 5 p. c. of his borrowings each year. In order to attract deposits from members, it is necessary that they should be strengthened and their activities be diversified. It can be possible only when they are made viable units and are managed efficiently and honestly. But in view of the fact that the rural people with some savings are tempted to lend privately to earn higher interest than deposits they make with the cooperative societies, the interest rates of society's deposits have to be higher and attractive. Efficient and impartial management, viability and pursuit of sound banking principles would go a long way in filling the bridgehead. The *Committee on Cooperative Credit* rightly stated, "the confidence that the administration of a cooperative society inspired in the public is also an important factor in obtaining deposits."

3. Reserve Funds. The reserve fund meets an unforeseen loss and serves as an asset and security in borrowings. According to the Govt. of India Resolution of June 17, 1912, "the reserve fund supplies a source of income which may be drawn upon in lean years. It fortifies outside confidence and attracts deposits, it protects members from money payments under their unlimited liability, it cheapens credit and perhaps most important of all it binds members together." (Para 22). As per the Cooperative Societies Act of 1912, the primary cooperative credit societies are required to carry over at least 25 p. c. of their net profits and it also permits any society, with the permission of the Registrar to the Reserve Fund to contribute 10 p. c. of the remaining profits to any charitable purpose. "An indivisible reserve is a fundamental feature of the Raiffeisen system to serve as a buffer between the members and the rigours of possible enforcement of unlimited liability." Further, to prevent dividend hunting, the maximum dividends which the primary credit societies can declare has been fixed by law. In many States it is generally 6 1/4 p. c. The reserve and other funds of the credit cooperatives increased from Rs. 8.86 crores in 1950-51 to Rs. 13.80 crores in 1960-61 and to Rs. 50.80 crores in 1976-77, but the percentage of reserve funds to working capital showed a sharp fall from 21.7 to 5.6 during the period. The inadequacy of funds may be attributed to the non-viability of the units, poor membership, low volume of business, and working of the societies with a narrow margin of 1 p. c. interest between their lending and borrowing rates. The reserve funds may be called the second line of defence against the enforcement of unlimited liability, the first being sound management.

The reserve fund, maintained by the society, belongs to the society and can be utilized : (i) to meet unforeseen losses incurred by the society ; (ii) to meet such claims of the creditors of the society as cannot otherwise be met ; and (iii) to provide for other financial needs in times of special scarcity.

However, no cooperative society, whose reserve fund has been separately invested or deposited can draw up, pledge or otherwise employ such funds, except with the sanction of the Registrar previously obtained in writing.

When a cooperative society is wound up its reserve fund is applied (by the liquidator) to discharge such liabilities of the society as may remain undischarged out of the assets of the society, viz., (i) the debts of the society ; (ii) the paid-up share capital ; and (iii) the dividend upon paid-up share capital at rates not exceeding 6 p. c. for any period or periods for which dividend has not been paid. No dividend can be paid on share capital if the bye-laws of the society do not provide for such payment.

Any surplus funds remaining after the above payment are made can be utilised for such object of public utility as may be selected by the general body of the dissolved society at a meeting approved by the Registrar.

4. Borrowings/Loans. The major portion of the funds which the village credit societies lend to the members, is obtained from the central financing agencies viz., the Central Cooperative Banks (working at the district level) and the State Cooperative Banks (working at the state level). The borrowing is the most important element of their working capital. Theoretically, a cooperative credit society, by inculcating thrift and self-help among its members, must be able to raise locally all the funds that it needs and in the words of H. W. Wolff (in *Peoples' Bank*) "*a society in debt to the Central Bank should be regarded as a sick society in hospital.*" Judged by this test, majority of the village credit societies have been chronically bed-ridden.

The borrowings of these societies increased from Rs. 19 crores in 1950-51 to Rs. 472 crores in 1967-68, and the proportion of borrowings to working capital moved from 45 p. c. to 67 p. c. during the same period.

The borrowings of the society are based on some criteria which differ from state to state according to their liability. The maximum borrowing power of unlimited liability societies is fixed in the general meeting. It is generally fixed at 1/6th, 1/8th of the value of the total net assets of the solvent members which is certified by the Panchayatdars of the society. Credit limit is fixed by the Registrar or the Central Cooperative Banks on the basis of factors such as the total assets of the members, their income, their repaying

capacity, owned funds of the society, its audit classification, repayment performance.

In Maharashtra, the borrowing limit is 8 times the paid-up share capital and accumulated losses. In U. P. it should not exceed 10 times the owned capital without the sanction of the Registrar. In West Bengal, the maximum borrowing power is fixed at 10 times the paid up share capital plus separately invested reserve fund. In Punjab, it is 10 times the owned funds excluding the borrowings from members. In Bihar, it is 10 times the share capital actually subscribed plus reserve fund. In Tamil Nadu, and Andhra Pradesh, it ranges from 8 to 10 times of the owned funds.

Though the borrowing limits are fixed under rules and by-laws or by the Registrar, the central or financing banks have a say in the determination of such limits.

In many states, the banks follow certain standards for sanctioning fresh loans to societies. In Maharashtra, no loans are advanced to defaulting societies. In Tamil Nadu and Andhra Pradesh, the banks do not advance fresh loans to a society where the overdues exceed 33.1 p. c. of the outstandings from members or the overdues of the society to the bank exceed 25 p. c. of the loans payable. In U. P. fresh loans are not advanced to a society whose overdues to a bank exceed 15 p. c. In Bihar, no fresh loans are given to a society whose overdues to banks exceed 20 p. c.

In certain states, the financing banks require cent percent repayment by constituent societies before advancing fresh loans. In case of default no fresh loans are given.

The following table shows the quantum of loan advanced by the State and Central Cooperative Banks to the primary agricultural credit societies.

Loans Advanced by State and Central Cooperative Banks

	1950-51	1955-56	1960-61	1968-69	1971-72	1973-74	1975-76	1976-77
State Cooperative Banks								
Loans and Advances made during the year (Rs. crores)	42.13	67.86	258.28	798.52	781.33	1161.91	1514.81	1717.08
Central Cooperative Banks								
Loans and advances made during the year (Rs. crores)	82.83	79.83	350.91	1020.83	1019.70	1248.54	1721.65	1807.94
Loans overdue as p. c. of loans outstanding	8.7	14.5	12.4	22	36	31	32	34

Source : *Annual Report of the Department of Cooperation for 1974-75* pp. 390-391 ; and *Report of the Department of Rural Development for 1977-78*, pp. 134-135.

In order to make the borrowings of the societies more impressive and sound, the V. L. Mehta Committee recommended that the Registrars of the Cooperative Societies may be authorised to fix the maximum credit limit of a limited liability society between 10 times to 12 times of its owned funds and of an unlimited liability society upto 1/6th of the value of net assets of the members after taking into account the various factors. (Such as credit worthiness of the society, the position of owned funds, the proper utilization of loans, arrangements of supervision and recovery of dues from individual members from the sale of crops raised by them etc.)

Working Capital. The working capital of the societies has shown an increase from Rs. 37.25 crores in 1950-51 to Rs. 273.92 crores in 1960-61 and to Rs. 812.22 crores in 1968-69 and to Rs. 2071 crores in 1976-77. Working capital per society was Rs. 168,634 in 1976-77. It was highest in Kerala (Rs. 626,112) and lowest in Manipur (Rs. 14,460).

Loans and Loaning Policy

The underlying idea of the cooperative credit is that a grant combining to furnish a collective guarantee can obtain funds at lower interest rates than they individually could command. The main point regarding co-operative credit is that it educates the borrower in the productive purposes and insists on punctual repayments.

Primaries supply short and medium-term loans to their members. *Short-term-loans* are given for one year for the purchase of seeds, fertilizers, pesticides, manures, implements, payment of wages to workers in the farm and payment of land revenue. *Medium-term-loans* are given for 3 to 5 years for the purchase of cattle, implements, equipments, construction of small irrigation facilities, including installing of pumping sets, repair of wells, construction of bunds and improvement of land.

The loans sanctioned to a member is related, in each case, to his production credit needs which are ascertained and recorded in detail; in some areas, these particulars are set in what is known as the "normal credit requirements" prepared by the society every year. Under this practice the credit limit of each member is fixed in advance of the seasons which not only safeguards against the lending of excessive amounts but also facilitates getting loan in time. This amount generally ranges from Rs. 250 to Rs. 2,500.

The total loans were given to the tune of Rs. 22.90 crores in 1950-51. They increased to Rs. 202.75 crores in 1960-61 and to Rs. 503.97 crores in 1968-69, and to Rs. 1153.35 crores in 1976-77. The average loan advanced for society increased from Rs. 1,983 in 1950-51 to Rs. 9,558 in 1960-61 and to Rs. 30,041 in 1968-69, and to Rs. 93,908 in 1976-77. In this Tamil Nadu took a lead (Rs. 297,161) closely followed by Kerala (Rs. 271,288) and Haryana (Rs. 260,376),

Maharashtra had only Rs. 956,48/- The loan per member also increased from Rs. 44 in 1950-51 to Rs. 119 in 1960-61 to Rs. 172 in 1968-69 and to Rs. 278 in 1976-77. The state average ranged from Rs. 769 in Gujarat to Rs. 390 in Maharashtra to Rs. 479 in Punjab, Rs. 777 in Haryana and Rs. 313 in Tamil Nadu.

It may be noted that not more than 38 per cent of the members of the agricultural credit societies borrow from these societies. In no State the percentage of borrowing members exceeds 60. This low proportion of borrowings is due to the causes like delay in issue of loans, inadequacy of loans, unwillingness of the members to sell produce through cooperatives, high rates of interest, inconvenient repayment schedule.

Of the loans that are granted to members, short term loans preponderate. They were 100 per cent in 1950-51 ; 85.9 per cent in 1960-61 and 90.7 per cent in 1968-69 ; and 89.5 per cent in 1976-77. Of the short-term loans advanced in 1976-77, about 83 per cent were given for seasonal agricultural operations ; 3 per cent for purchase of agricultural implements, 3 per cent for marketing of crops ; 3 per cent for consumption and 8 per cent for other purposes

Of the total loans granted, 10.5 per cent were given as medium term loans in 1976-77 as against 9.3 per cent in 1968-69, 9.8 per cent in 1960-61 and nil in 1950-51. Of the total medium term loans in 1976-77 about 47 per cent were for purchase of cattle ; 20 per cent for minor improvements ; 21 per cent for other purposes ; 7 per cent for purpose of machinery and 5 per cent for sinking and repairs of wells.

Security

In most parts of the country, landed property is commonly insisted upon as the security for cooperative production credit, though loans are also given on the security of movable property and against the personal security of one or more members. The *All-India Rural Credit Survey Committee* recommended that security for landed property should not be sought for short term loans and that loans should be given on personal security of the borrowing member after creating a statutory charge on his crop. The view of the *All India Credit Review Committee* has been that "no cultivator should be denied full production credit on the basis of the agreed scale of finance if he can offer personal security." Increasingly, now the emphasis is being placed on the repaying capacity of the cultivators and the production proposed to be taken by them as the basis for credit, i.e., for determining the quantum of credit ; the shift is from assets held to the crop to be raised, though adequate security continues to be taken by way of sureties. As regards medium-term loans, landed property need not be taken as security for the loans upto Rs. 500 while a statutory charge created on land would suffice for loans of Rs. 501 to Rs. 1,000. Loans for higher amounts need security in the form of mortgage of land. About 50 per cent of the loans are secured

against immovable property, specially in M.P., Maharashtra, Karnataka, Orissa and West Bengal : while agricultural produce formed the main security for loans in U. P. and Gujarat.

Rate of Interest

The *Central Banking Enquiry Committee* (1931) said that, "one of the main requisites of agricultural credit should be that it is not too costly." Shri V. L. Mehta also suggested that the rate charged should be lowest possible consistent with safety and allowing for management expenses and bad debt insurance.¹ The *Gadgil Committee on Agricultural Finance* opined that where co-operative societies' lending rates were high the government should subsidise them.² The *MacLagan Committee* held that the society's profit depended mainly on the difference between its borrowing and its lending rates and until the reserve fund had reached a substantial figure, it was a mistake to reduce unnecessarily the rates at which money was lent to the members. The gist of all these opinions is that as far as possible the credit should be cheap.

The rates of interest charged by primary agricultural credit societies on advances to members varied from 5 3/4 per cent to 9-3/8 per cent per annum. The minimum of 6 3/4 per cent obtained in Andhra Pradesh, Bihar, J. and K., Kerala, Tamil Nadu, Rajasthan, and Tripura. The societies in U. P. charged interest at 8-2/3 per cent while in Maharashtra and Gujarat it was 7-13/16 per cent. In Manipur and M. P. it was 9 and 7 1/2 per cent respectively. The usual rate of interest has fallen from 12 per cent in 1950-51 to 9 per cent in 1976-77. The highest rate of interest has also gone down from 15-5/8 per cent to 12 per cent during the same period.

Period of Repayment

The period of loan is determined mainly by the possibility of repayment out of the income derived from its use or the resulting savings.³ The *MacLagan Committee* has observed that "unless loans are repaid punctually, co-operation is both financially and educationally an illusion". It further laid down that "where the average cycle consists of one good, one bad and two indifferent years, the society should require payment after the first good harvest but that normally two years should be the maximum period of payment for non-productive loans".⁴ Two or three annual instalments usually are allowed for the repayment of advances taken for the short period and objects such as the liquidation of previous loans, improvement of land or purchase of land and instalment of agricultural machinery. In our opinion, the recovery of loans should be adjusted to the cyclical trend of production. Thus, 18 months should be maximum

1. V. L. Mehta, *Co-operative Finance*, p. 8.

2. *Agricultural Finance Sub-Committee Report*, p. 86

3. V. L. Mehta, *Co-operative Finance*, p. 8.

4. *MacLagan Committee Report on Co-operation in India*, p. 38

period for short-term loans and 5 to 10 years for medium-term loans.

Overdues. The overdues situation, though better than before, still constitutes a large proportion of the outstandings. The amount of overdues rose sharply from Rs. 6 cr. in 1950-51 to Rs. 15 cr in 1955-56, to Rs. 44.30 cr. in 1960-61, Rs. 125 cr. in 1965-66, Rs. 214.04 cr. in 1968-69 and to Rs. 611.78 crores in 1976-77. The proportion of overdues to outstanding has gone up from 22 in 1950-51 to 25 in 1955-56, to 29 in 1965-66 and to 35 in 1968-69 to 42 in 1976-77. It was as high as 81 per cent in Assam, 77 per cent in Bihar, 58 per cent in M.P., 56 per cent in Punjab, and 48 per cent in Orissa. The State with comparatively low overdues i.e. less than the all India average were Gujarat (37 per cent), Tamil Nadu (23 per cent) and Kerala (35 per cent). The amount of overdues shows that the principles of co-operation have not been put into practice so that a very large percentage of loans remained as outstanding. Some of the more important causes for this are over-financing, grant of loans for the repayment of ancestral debts, lack of proper security of the objects of loans and the repaying capacity of the borrowers, ineffective supervision over the utilisation of loan and leniency in demanding punctual payment of the loan and cancelling them by fictitious repayment and automatic renewals. According to the *Reserve Bank's Review*, "the accumulation of heavy overdues and freezing of the assets of the societies naturally result in clogging their business and paralyse the working of the co-operative movement over large parts of the country. Coercive action against the defaulters should be taken provided no effective remedy for this state of affairs is found since it only saddles the societies with lands which are difficult to dispose of and the management of which gives rise to complicated problems."

The raising trend in the outstanding loans points to the necessity of introducing seasonality in the matter of grant and recovery of loans for various crops, under which the loans should be given during the sowing season and the date of recovery should be fixed as near as possible to the period when the marketable crop of a majority of cultivators in the area is likely to be marketed. Conversion of short term loans into medium-term loans in areas affected by natural calamities by having recourse to agricultural credit stabilisation funds may be adopted for lessening overdues. Drives for collection of past overdues should be organised. Adoption of more liberal policies such as relating the size of credit to production outlays, effective linking of credit with marketing and strict supervision will also solve the problem.

Limits of Borrowing

There are limits to the extent to which a primary credit society can borrow. The maximum borrowing power of an unlimited liability society from the central co-operative bank is usually fixed at one-eighth of the total net assets of its members in some States, though in some areas it is placed at a particular multiple of the

land revenue paid by all the members in a year. In a limited liability society, the total outside borrowings including deposits are generally restricted to eight times the owned funds comprising paid-up capital and reserve fund. It is in the context of increasing the borrowing power of societies and enabling them to provide larger finance to members that the principle of State partnership, recommended by the *Rural Credit Survey Committee* in respect of large-sized societies, has been advanced by the *Co-operative Credit Survey Committee* with regard to all viable societies. The contribution to be made by the Government to the share capital of a society is ordinarily limited to Rs. 5,000. In the case of very large villages and those selected for rapid increase in agricultural credit or in the case of backward areas, the Government contribution may go up to Rs. 10,000.

Distribution of Dividends

In regard to the distribution of profits the Co-operative Credit Societies Act of 1904 provides that, "No part of funds of a registered society shall be divided by way of a bonus or dividend or otherwise among its members provided that : (i) after at least 1/4th of the net profits in any one year have been carried to a Reserve Fund, payments for the remainder of such profits and from any profits of past years available for distribution may be made among the members to such an extent and under such conditions as may be prescribed by the rule or by-laws ; (ii) in the case of a society with unlimited liability no distribution of profits shall be made without the general or special order of local Government on this behalf." Thus dividend may be declared only after reserving 45 per cent of the net profits for Reserve Fund at a rate not exceeding 6 1/4 per cent. Out of the balance, if any, the society may constitute funds to meet future eventualities or expenses or create a common good fund.

Non Credit Operations of the Primary Credit Societies

Apart from provision of capital, Primary Credit Societies also supply agricultural requisites (implements, seeds, pesticides, fertilizers) and consumer articles (like sugar, rice, wheat, kerosene) against cash and loans sanctioned to them.

Some of the societies also undertake marketing of the produce of their members but such activities are very limited. They marketed produce worth Rs. 1189 crores.

None of the societies in Haryana, Tamil Nadu, U. P., Orissa, Punjab, Rajasthan undertook processing activities. Only 70 societies, processed goods worth about Rs. 2 crores.

In Andhra Pradesh, Bihar, Gujarat, M. P., Maharashtra, Karnataka, Orissa, and Punjab these societies distributed fertilizers to the tune of Rs. 732 crores ; pesticides Rs. 29 crores ; implements Rs. 24 crores ; seeds Rs. 51 crores etc.

Of late, the marketing and processing activities of the credit societies are reduced because steps have been taken to strengthen the marketing and processing societies.

Present Position of Primary Societies

At the end of 1976-77 there were 1.23 lakh primary credit societies with a membership of about 51.5 millions. These societies covered 97 per cent of the villages of the country, 47 per cent of the rural population and 43 per cent of agricultural families. The total short and medium-term loans advanced by these societies was Rs. 1153.35 crores. Nearly 45 per cent of the loans from co-operatives were for amounts up to Rs. 500 and about 70 per cent loans upto Rs. 100.

A major weakness inhibiting the flow of larger co-operative credit has been due to the existence of a larger number of non-viable primary agricultural societies. The programme of reorganisation of these societies envisaged the amalgamation of weak societies with better managed societies in the neighbourhood. As a result of this programme, the total number of primary agricultural societies has been brought down from 2.12 lakhs in 1960-61 to 1.56 lakhs in 1972-73. This number was expected to go down to 1.50 lakhs by the end of the Fourth Plan as compared to the target of 1.20 lakh viable and strong primary agricultural credit societies.

Reorganisation Programme

At the end of June 1977, there were 1.23 lakh societies. The Fifth Plan had estimated that these societies will be reorganised and be reduced to 1.15 lakh of viable societies. Consequent on the national decision following debt relief legislative measures and the Report of the *Expert Committee on Consumption Credit* this programme was reviewed. Broad guidelines indicating norms for re-organisation have been laid down according to which a viable primary credit society should have : (a) minimum loan (short-term) business of Rs. 2 lakhs ; (b) gross cropped area of 2,000 hectares within a radius of 10 kms ; and (c) appointment of a full-time paid secretary. As a result of these, it is estimated that the total number of reorganised societies may come to about 1 lakh.

The programme of re-organisation has been more or less completed in practically all States, except Gujarat, Punjab and Maharashtra. The primary objective of the re-organisation programme is to build up strong viable multi-purpose base level co-operative structure which can undertake the functions of credit, supplies and services required in the rural areas, particularly for weaker sections. The Farmers Service Societies have also been organised as part of the re-organisation programme, with professional well-paid manager supported by technical expertise and predominance of weaker sections on the Board of Management. Such societies could be formed by covering an existing primary credit society or organising a new one. Generally

the area of such societies is larger as it should have enough potential to sustain its operations and meet the cost of establishment over a period of years. Initially, these societies subsidised by the State governments or the SMDA and other special agencies. By June 30, 1977, 512 such societies had been organised. Of these, 164 are financed by commercial banks and 348 by co-operatives.

PROBLEMS OF PRIMARY AGRICULTURAL CREDIT COOPERATIVES

The data given in the above tables may give a rosy picture about the progress of these Primary Societies. But these suffer from following weaknesses :

1. Uneven Progress. The over-all progress of credit co-operatives has been satisfactory but it is strikingly uneven. Four states of Gujarat, Maharashtra, Punjab and Tamil Nadu accounted for over 53 % of the total volume of credit given (in 1976-77).

Further the coverage of rural population for the country as a whole was only 47. But it varied from 76% in Tamil Nadu to 48% in Haryana ; and 67% in Maharashtra to only 15% in Assam, 18% in West Bengal, 31% in Bihar, 57% in Rajasthan, 67% in M.P. and 42% in Andhra Pradesh. The co-operative credit movement is weak in Northern and Eastern states while it is strong in Western and Southern states.

2. Misuse of Loans. Diversion and misuse of loan are common practice among borrowers. Nearly 28% of the co-operative credit was diverted to purposes other than those for which it was given. This percentage was 23 in case of short term loans and 35 in case of medium term loans. This tendency has been high in Rajasthan, Orissa, Kerala, Bengal, Tamil Nadu, Punjab, U. P., Assam etc.

The diversion and misuse of loans has been due to (i) weak financial position of the borrowers ; (ii) priority to some other needs over agricultural needs ; (ii) deficiency of credit advanced ; (iv) inadequate supervision and unsatisfactory management.

3. Inadequate Deposits. The credit co-operatives have failed to attract deposits partly because of the poverty of the members and partly because of the lack of confidence of members in these societies.

4. High Overdues. A large proportion of the loans outstanding is represented by overdues. This is because so far expansion and not consolidation has been the watchword of the authorities concerned. Proper attention is not paid to timely recovery of the loans advanced. It is too easy to distribute agricultural credit but extremely difficult to recover it. Most of the societies adopt unquestionable practices to conceal overdues. The methods usually followed are book adjustment, renewal of loans and conversion.

The failure to get recovery of loans leads to stagnation of the societies in many states. The main reasons for increasing overdues are defective loaning policies, inadequate supervision, weakness of internal management and absence of full time paid secretaries to recover loans in time.

5. Credit Is Neither Adequate Nor Cheap. The amount of loan given to members is quite inadequate so that members are attracted towards moneylenders for getting rest of the need fulfilled. Further the abuse of co-operative credit is that it is given both for productive and unproductive proposes.

6. Large Proportion of Dormant Societies. About 15 per cent of the total societies are dormant. This percentage is as high as 60 in Assam and as low as 22 in Orissa. This is due to the fact that several societies which have been classified as 'active' or 'non-dormant' have actually been doing only 'Token business' and as such they are not 'active' societies.

Suggestions for Improvement

1. *The Societies should cover as many villages and members as possible* in a given area so that efficient and economic management could be possible.

2. The dormant societies are parasites which influence the growth of a healthy co-operative structure. *They should either be revitalised or closed down* so that other organisations connected with them (central financing agencies) could be saved from loss.

3. The proper recovery of loans is not only pre-requisite for a rapid expansion of agricultural credit, but also question of life and death for any credit agency. *In fact, no credit agency can increase its credit supply unless the recovery of its loans is satisfactory.*

4. The accumulation of heavy dues result in clogging the business and paralyse the working of the co-operatives. *Therefore, coercive action against the defaulters should be taken.* Adoption of more liberal policies such as relating the size of credit to production outlays, effective linking of credit with marketing and strict supervision should also be done.

5. Credit alone is of no use for small farmers if it is not accompanied by other complimentary services such as agricultural extension, wholesale prices for farm requisites, marketing, storage facilities and consumer co-operatives.

6. *The members of the societies involved in the task of supervision should be trained properly in the principles of co-operative education.* Full time salaried secretaries should be appointed for the societies.

7. The societies should embrace as many former members as possible in given agricultural marketing and geographical area, consi-

dering primarily membership contact. This is to achieve efficient administration and economic management on the one hand and provide farmer-members with accessibility and efficient credit service on the other.

8. They should be properly set up to give loans and technical advice to small and medium farmers in areas where opportunities and desire to increase agricultural production exist.

9. They should possess those elements of local leadership, grassroot support, and democratic control, which are essential for their effective working.

10. They should be instruments for mustering local finance in the form of capital and savings, with a view to making the co-operatives progressively less dependent upon outside financial assistance.

11. They should have limited liability ; and in order to guard against failure on account of unsatisfactory management, the best policy would be to start with credit functions first and then to add supply and marketing activities at a later stage.

12. The membership of such co-operatives should be divided into informal groups of about 20 to 40 farmers each, on the basis of proximity of residence and similarity of farm business. This approach is very important in encouraging group education and in serving as a medium through which mutual control for credit supervision and punctual repayment of loans is exercised.

There is a need for a close and intimate co-ordination between the short and medium term structure on the one hand, and long-term structure on the other. In this connection these measures may be suggested :

(i) Inter-representation between the committees of management of both agencies at corresponding levels ;

(ii) investment of a part of the sinking fund of the state land development banks as deposit in state co-operative banks ;

(iii) subscription to the ordinary debentures floated by the state land development bank and the apex co-operative bank ;

(iv) utilization of the offices of apex and central banks for canvassing support for the debentures floated by state land development banks, and

(v) association of the primary credit/service societies with investigation of long-term loan applications and in the supervision of the utilization of such loans and their recovery.

In brief, the reduction of overdues, mobilization of deposits, revitalisation of the dormant societies, amalgamation of the weaker ones into viable units, introduction of crop system, effective linking of credit with marketing and improving the overall efficiency of

cooperatives by toning up their management and better supervision of the use of loans at all levels are the most important aspects of future co-operative policy. If these are accomplished, co-operative societies and co-operative banks may cease to be mere groups of borrowers as at present and emerge as effective banking agencies and serve the cause of agricultural production better than at present.

GRAIN BANKS

These banks are a particular type of primary credit society found in certain areas, specially in Andhra Pradesh, Maharashtra, Orissa and Karnataka, where monetised economy has not yet replaced fully the age-old barter system. The object of these banks is to provide loans to members in kind and to recover them generally on the *sawai* basis, at the next harvest season.

There are nearly 10,000 grain-banks in India with a total membership of 12 lakhs and a working capital of about Rs. 8 crores. Andhra Pradesh, Maharashtra, Karnatak and Orissa accounted for 95.5 per cent of the total number of grain banks.

Some of the grain banks have their dealings only in grain, while others in grain as well as cash as in Orissa, where they are known as *grain-cum-cash credit societies*. In such society every member is to take two different kinds of shares, namely, cash shares and grain shares. The cash and grain loans are related in each case to the cash grain shares held by the members. Grain loans must be repaid in grain and cash loans in cash. The grain resources of the society consist of share capital paid in grain and deposits of grain from members, the gram panchayats and government. No part of the cash resources of the society is used in purchasing grain. A ceiling is fixed for the stock of grain to be held by each society, the excess of stocks above which are to be sold at prices fixed by the Government. These banks also undertake the distribution of seeds, fertilizers and other requirements.

Appendix 1
Primary Agricultural Credit Societies—1976-77
(Provisional)

States/U. Ts.	No. of Societies	Member-ship (000)	% of Rural population covered (Estimated)	Share Capital		Deposits	Working Capital
				Total	Govt. contribution		
1	2	3	4	5	6	7	8
1. Andhra Pradesh	14627	2941	42	1553	137	545	12273
2. Bihar @	16500	3400	31	708	150	178	4885
3. Gujarat @	8655	1725	39	4425	61	823	28775
4. Haryana	2766	927	48	930	270	142	7734
5. Himachal Pradesh	2381	538	84	365	29	873	2081
6. Karnataka	5874	2461	47	2310	5075	665	15327
7. Kerala @	1731	2206	59	1460	254	2144	10838
8. Madhya Pradesh	7484	2663	32	2677	588	728	17365
9. Maharashtra	13913	4643	67	7543	152	745	33065
10. Manipur	657	82	37	20	N.A.	2	95
11. Nagaland @	163	455	N. A.	1	—	—	4
12. Orissa	3225	2035	45	1156	315	255	6520

(Amount in Rs. lakhs)

13.	Punjab @	...	10205	1565	76	1711	142	2318	10544
14.	Rajasthan	...	5149	2160	51	1966	530	338	10828
15.	Tamil Nadu	...	4825	4584	76	3044	588	990	25882
16.	Tripura	...	356	82	30	39	11	3	220
17.	Uttar Pradesh	...	9049	7729	51	4416	478	1070	16225
18.	West Bengal @ @	...	9577	1193	18	580	122	92	3894
Union Territories									
19.	A. & N. Islands	...	44	4	17	3	2	—	12
20.	Chandigarh	...	32	4	31	2	—	3	12
21.	D. & N. Haveli @	...	12	5	34	1	—	—	11
22.	Delhi @ @	...	278	33	41	34	11	26	248
23.	Goa, Daman & Diu...	...	140	59	42	20	8	2	102
24.	Lakshadweep @	...	7	3	41	2	1	2	9
25.	Mizoram @ @ @	...	101	—	N. A.	2	1	—	11
27.	Pondicherry	...	66	28	51	23	8	1	211
All-India		...	122817	41547	47	34991	8933	11935	207111

Data in respect of Assam Jammu & Kashmir & Meghalaya not available.

@ Data relates to 1975-76.

@ @ Data relates to 1974-75.

@ @ @ Data relates to 1972-73.

Appendix 2

Primary Agricultural Credit Societies—1976-77—Operational Details

(Amount in Rs. Lakhs)

States/U.Ts.	Loans advanced			Loans outstanding		Loans over-due	Loans overdue as% of loans outstanding
	Total	Medium term	Medium term	Total	Medium term		
1	2	3	3	4	5	6	7
1. Andhra Pradesh	3751	433		8494	1484	3152	37
2. Bihar @	2200	400		2994	541	2804	77
3. Gujarat @	13262	2565		21042	7585	7800	37
4. Haryana	7202	598		6175	885	2223	36
5. Himachal Pradesh	585	333		1238	688	417	34
6. Karnataka	8299	706		8326	396	4201	50
7. Kerala @	4696	725		5671	1112	1965	35
8. Madhya Pradesh	8151	593		11430	2408	6674	58
9. Maharashtra	18090	2954		16564	8266	11600	44
10. Manipur	43	—		116	—	28	24
11. Nagaland @	2	—		—	—	—	—
12. Orissa	2319	669		3998	1213	1899	48

13. Punjab @	7498	206	6611	748	3727	56
14. Rajasthan	5917	277	6916	620	2724	39
15. Tamil Nadu	14338	519	18127	5261	4160	23
16. Tripura	30	1	121	14	68	56
17. Uttar Pradesh	13036	1079	14699	1894	7199	49
18. West Bengal @ @	2127	61	2807	189	939	33
Union Territories						
19. A. & N. Islands	8	5	16	7	9	56
20. Chandigarh	9	4	9	4	2	22
21. D. & N. Haveli @	8	—	8	—	2	25
22. Delhi @ @	88	—	152	17	1	1
23. Goa, Daman & Diu	33	8	53	21	21	40
24. Lakshadweep @	5	—	6	1	1	17
25. Mizoram @ @ @	—	—	—	—	1	—
26. Pondicherry	38	4	129	36	61	14
All-India	115335	12140	145702	33393	61178	42

Data in respect of Assam Jammu & Kashmir and Meghalaya not available.

@ Data relates to 1975-76.

@ @ Data relates to 1974-75.

@ @ @ Data relates to 1972-73.

Appendix 3
Primary Agricultural Credit Societies-- 1976-77

States/U.Ts.	Average per Society					Average per Member				
	Member- ship (Nos.)	Share Capital (Rs.)	Deposits (Rs.)	Working Capital (Rs.)	Loans advanced (Rs.)	Share Capital (Rs.)	Deposits (Rs.)	Loans advanced (Rs.)		
1	2	3	4	5	6	7	8	9		
1. Andhra Pradesh	201	10617	3726	83906	50256	53	19	250		
2. Bihar**	206	4291	1078	29606	13333	20	5	65		
3. Gujarat*	199	51127	9605	332467	153229	257	48	769		
4. Haryana	335	33623	5134	279610	260376	100	15	777		
5. Himachal Pradesh	226	15327	36659	87385	24565	68	162	109		
6. Karnataka	419	39326	11151	260929	141284	94	27	337		
7. Kerala**	1274	84344	123859	626112	271288	66	97	213		
8. Madhya Pradesh	358	35770	9727	222028	108912	100	27	304		
9. Maharashtra	245	39882	3939	174728	95648	162	16	390		
10. Manipur	125	3044	304	14460	6545	24	2	52		
11. Nagaland**	2791	6135	104	24540	1227	—	—	—		
12. Orissa	631	35845	7907	202171	71907	57	13	114		
13. Punjab*	153	16766	22714	103322	73474	109	148	479		
14. Rajasthan	419	38182	6564	210293	114916	91	16	274		
15. Tamil Nadu	950	63088	20518	535171	297161	66	22	313		

16. Tripura	236	10955	843	61798	8427	46	4	36
17. Uttar Pradesh	854	48801	11825	179302	144060	57	14	169
18. West Bengal**	125	6056	961	40660	22209	49	8	178
Union Territories								
19. A. & N. Islands	91	6818	—	27273	28182	75	—	200
20. Chandigarh	125	6250	9375	37500	28125	50	75	225
21. D. & N. Haveli*	417	8333	—	91667	66667	20	—	160
22. Delhi**	199	12230	9353	89209	31665	103	79	267
23. Goa, Daman & Diu	421	14286	1428	72858	23571	34	3	56
24. Lakshadweep*	428	28571	28571	128571	71429	67	67	71
25. Mizoram***	—	1980	10	10891	198	—	—	—
26. Pondicherry	424	34848	1515	319697	57576	82	4	136
All-India	338	28490	9718	168634	93908	84	28	278

Data in respect of Assam, Jammu & Kashmir and Meghalaya not available.

*Data relates to 1975-76.

**Data relates to 1974-75.

***Data relates to 1972-73.

18.

Other Cooperative Credit Institutions

CENTRAL COOPERATIVE BANKS

The Central Banks work as an intermediary to link the primary societies with the money market. They serve as the 'balancing centre' for adjusting the surplus and deficiency of working capital of the primary societies. According to Dr Laud, "The *raison d'être* for the establishment of district central cooperative banks is that there should be an intermediary agency between the primary credit society with rural bias run by agriculturists having no touch with the money market and the provincial cooperative bank run mainly by city men with urban bias having no close association with the countryside".

The Central Cooperative Banks occupy and form an important position in the cooperative credit structure. They form an important link between the State Cooperative Bank and the primary agricultural credit societies. The success of the cooperative credit movement largely depends on their financial strength.

Functions

The main functions of the Central Cooperative Banks are :

(1) *To meet the credit requirements of primary member societies.* for production, marketing and supply operations by arranging a regular flow of credit to them.

(2) *To undertake ordinary commercial banking business.* (such as the accepting of deposits from the public collecting bills, cheques, hundies, railway receipts, safe custody of valuables, purchase and sale of securities and advancing loans to individual members against fixed deposit receipts, government paper, gold, silver and agricultural produce) in rural areas.

(3) *To act as balancing centres for the primary societies,* by making them available the surplus funds of some societies to those which face shortage of funds and thus equalise the flow of the

capital. Their own resources are intended to serve as a cushion to absorb the impact of the defaults and arrears arising at the primary level.

(4) *To undertake non-credit activities*, such as the supply of seeds, manures, foodstuffs and consumer goods.

(5) *To maintain close and continuous contact* with the primary societies and provide leadership to them.

(6) *To supervise and inspect the primary societies*, and ensure a satisfactory implementation of the recognised credit societies.

(7) *To provide a safe place for the investment* of the resources of primary societies.

Area of Operation

The area of operation varies from the taluka to district and tehsil in some States to a district, or several talukas or tehsils in other States. Although the *MacLagan Committee* (1915) recommended that, "a central bank should cover as large an area as compatible with convenience and efficiency, the present policy is that there should be only one central bank for each revenue district so that it could be strong enough as an 'economic unit,' i. e., its owned funds should not be less than Rs. 3 crores and its working capital should be of the order of Rs. 20 to 25 lakhs.

As a result of reorganisation of the weaker units, the number of Central Cooperative Banks has come down from 505 in 1950-51 to 478 in 1955-56, to 380 in 1960-61, to 346 in 1965-66, to 341 in 1968-69. In 1976-77, the total number stood at 343.

Membership

The membership is confined both to individuals and the societies. Membership is open not only to rural cooperative credit societies but also to marketing societies, consumers' stores, farming societies and urban cooperative credit societies. Individuals are no longer accepted as members on grounds of safety. Hence, the individual membership fell from 1.44 lakhs in 1955-56 to 1.09 lakhs in 1968-69; while the membership of primary societies increased from 1.56 lakhs in 1955-56 to 2.45 lakhs in 1968-69.

Sources of Finance

Central Cooperative Banks raise funds by way of share capital deposits from public; borrowings from the State Cooperative Banks, grants from the government and loans. The share capital of the central cooperative banks has shown a considerable rise from Rs. 4 crores in 1950-51 to Rs. 38 crores in 1960-61. It stood at Rs. 76 crores in 1965-66, at Rs. 115 crores in 1968-69, at Rs. 211 crores in 1974-75 and at Rs. 248 crores in 1976-77.

The average share capital per bank moved from Rs. 0.80 lakh in 1950-51 to Rs. 9.98 lakhs in 1960-61, to Rs. 33.79 lakhs in 1968-69, and to Rs. 72.50 lakhs in 1976-77. The amount contributed by the States in the share capital of the Central Cooperative Banks increased from Rs. 10 crores in 1960-61 to Rs. 29.88 crores in 1968-69 and to Rs. 72.12 crores in 1976-77. The deposits of Central Cooperative Banks increased from Rs. 38 crores in 1950-51 to Rs. 111 crores in 1960-61, to Rs. 351 crores in 1968-69 and to Rs. 1072 crores in 1976-77. The average deposits per bank moved from Rs. 7.48 lakhs in 1950-51 to Rs. 29.10 lakhs in 1960-61, to Rs. 102 lakhs in 1968-69 and to Rs. 313 lakhs in 1976-77. The highest average deposit was in Maharashtra and Gujarat. The weakness of these banks in Assam, Bihar, Rajasthan, W. Bengal, was reflected in the very low level of deposits of Central banks in these states.

The importance of deposits has been expressed by the *All India Rural Credit Review Committee* in these words, "They help the banks immediately by enabling them to cushion their overdues and thereby maintain an uninterrupted flow of credit from the higher financing agencies. The expanding area and scale of cooperative activity and growing diversification have also made it necessary that cooperative banks should build up larger resources by way of deposits." The deposits may be had in the current account, in the savings account and fixed deposit account. These banks may also accept recurring deposits, day deposits, and provident fund deposits.

The borrowing capacity of the Central Cooperative Banks is generally related to their own funds. In practice, a ratio of 1:10 between owned funds and deposits is generally considered as the norm. The borrowing power of these banks is generally fixed at 12 to 15 times of their paid-up share capital and reserve fund. These borrowings are from outside agencies viz., the State Cooperative Banks, Government, R.B.I., State Bank of India and other central banks and joint stock banks. These banks usually get funds at 2 1/2 to 4 percent rate from the State Cooperative banks, while the lending rate is from 4 to 6 per cent; thus the margin of 2 per cent is their income which is used in meeting overhead and administration costs.

Loaning Policy

Loans are generally advanced to primary credit societies for financing agriculture such as cultivation expenses, purchase of seeds, mature and other requirements for seasonal agricultural operations for a short-term (for 12 months); land reclamation, building of cattle sheds, digging and repairing of wells, purchase of cattle and carts for medium term (from 1 to 3 years); for purchase and installation of pumps and oil engines for a medium term (not exceeding 5 years) and for refund of deposits (for not exceeding one year). Loans are granted on proper security, landed assets, house mortgage, cattle, agricultural produce, gold or ornaments, fixed deposit receipts, life insurance policies; government promissory notes, and pronotes

executed by the borrowing societies. At the society level, the loans are secured by personal security for solvent members and mortgage of lands. The amount of loans advanced increased from Rs. 83 crores in 1950-51 to Rs. 351 crores in 1960-61, to Rs. 1021 crores in 1968-69 and to Rs. 1808 crores in 1976-77. The amount of loan advanced per bank moved from Rs. 16 lakhs in 1950-51 to Rs. 92 lakhs in 1960-61, to Rs. 329 lakhs in 1968-69 and to Rs. 527 lakhs in 1976-77.

The most disquieting trends in the working of these banks is the rise in percentage of overdues, which increased from 8.7 in 1950-51 to 12.5 in 1960-61, to 22 in 1968-69 to 32.30 in 1973-74 and to 33.52 in 1976-77. This high proportion of overdue has been due to poor quality of supervision, lack of prompt action against wilful defaulters and a general slackness in the efforts to recover loans.

The rate of interest on loans and advances charged by these banks range from 5 1/2 to 6 1/4 per cent. The margin retained by these banks on the advances in respect of funds obtained by borrowing from the Apex bank varies between 1 to 3 per cent

Management And Supervision

The management of the Central Cooperative Banks generally vests in the Board of Directors, consisting of 12 to 15 members.

These banks supervise the primary societies. At least one supervisor looks after 20 societies and one senior supervisor every 80 supervisors.

Growth And Development of the Banks

The first central bank was opened in U. P. in 1906 as a primary society. It was followed by such banks in M. P. and Rajasthan in 1910. Upto 1918, many such banks were opened in other parts of the country. Between 1919-1929, Central Banks did increase from 233 in 1919-20 to 588 in 1929-30, and, their membership increased from 1.22 lakhs to 1.9 lakhs and working capital from Rs. 6.43 crores to Rs. 30.90 crores during this period. During Economic Depression of the Thirties the working of the banks was hard hit so that the membership declined to 0.91 lakh in 1936-37; though the number of banks increased to 611. During war years, these banks made some progress. Their membership increased to 1.98 lakhs, working capital to Rs. 45 crores and deposits to Rs. 33 crores in 1945-46. In spite of this progress, the cooperative banks suffered from heavy overdues, small financial resources and too much dependence upon State banks and weak internal organisation.

All these needed considerable reorganisation. Therefore, during the First Plan, the States began to follow the progress of reorganisation and amalgamation of weaker units. This progress was vigorously followed even during the Second Plan. The principle of "one

Central Bank for each unit" was followed in all States as per the recommendations of the Rural Credit Survey Committee Report. As a result of this reorganisation policy the number of central banks fell from 505 in 1950-51 to 380 in 1960-61. In some States like Bihar, Punjab, Rajasthan, and W. Bengal, this programme of reorganisation was also followed during the Third Plan period. So that the number of central cooperative banks further fell from 380 in 1960-61 to 346 in 1965-66, to 341 in 1973-74 and it was 342 in 1976-77.

Evaluation

The present policy is to have one central bank for each district. In some States like Andhra Pradesh, Assam, Bihar, W. Bengal, Punjab, Orissa, Haryana and Tamil Nadu, more than one bank still continues to exist in the same district. The share capital of the banks was Rs. 193 crores in 1973-74 and 249 crores in 1976-77. The State governments provided about 28 p. c. of the total share capital of these banks (i. e. Rs. 54.13 crores and Rs. 72.12 crores respectively.) The deposits of these banks stood at Rs. 718 crores in 1973-74 and Rs. 1073 crores in 1976-77. The average deposit per bank was Rs. 21 lakhs and 313 lakh. The average deposit collected by these banks was highest in Maharashtra and lowest in Assam. To attract more deposits a large number of new branches were opened in the rural areas.

However, the position of these banks in regard to overdues was not satisfactory. These formed 31 per cent of the outstandings. W. Bengal and Assam had more than 60 per cent of outstandings, while in Andhra Pradesh, U. P., Bihar, Orissa, Punjab and Haryana it ranged from 40 to 60 percent. The chief reasons for such a high percentage of overdues were : famine and scarcity conditions which made it difficult to recover loans in time ; defective loaning policies and faulty procedures ; slackness in supervision and managerial deficiencies at the bank's and the primary societies' level.

The achievements of central banks have been well summed up by the Madras Committee on Co-operation thus: "The central bank has served their purpose of financing rural and urban societies and balancing their funds admirably well; they mobilised local deposits and made them available to primary societies at reasonable rates of interest and have rendered great service in the organisation of agricultural finance on co-operative lines. They have drawn into the movement a number of honorary men whose services have been invaluable to the progress of the co-operative movement: they have taken a genuine interest in the growth of the movement in their respective areas and in schemes of co-operative education and rural development generally. They have enlisted the sympathy of an increasing body of depositors, and as a rule, have justified the confidence which the depositors have reposed in them."

But they cannot be wholly absolved from blame for the present bad plight of the village societies. The banks found themselves with a plethora of funds and initiated a policy of hasty expansion of pri-

The Progress of Central Co-operative Banks will be clear from the table given below :

PROGRESS OF CENTRAL CO-OPERATIVE BANKS

Items	1950-51	1955-56	1960-61	1968-69	1969-70	1970-71	1971-72	1973-74	1974-75	1975-76	1976-77
1. No. of banks	505	478	380	341	340	341	341	341	341	344	343
2. Share capital (Rs. crores)											
(a) Total	4.04	8.50	37.93	115.24	127.91	141.13	157.63	192.68	211.20	236.74	248.66
(b) Govt. contribution	NA	1.26	10.04	29.88	33.19	37.50	45.32	54.13	58.03	66.47	72.12
3. Deposits											
(Rs. crores)	37.79	55.71	110.59	350.84	381.71	438.55	509.73	718.60	805.32	984.12	1072.91
4. Loans & advances made during the year											
(Rs. crores)	82.83	79.83	350.91	1020.83	1195.47	866.38	1019.70	1248.54	1524.50	1721.65	1807.94
5. Loans over-due as percentage of loans outstanding	8.7	14.5	12.4	27	29	34	36	2.33	31.00	32.18	33.52
6. Average Per bank (Rs. lakhs)											
(a) Share capital	0.80	1.79	9.98	33.79	37.62	41.4	46.23	56.51	61.92	68.65	72.50
(b) Deposits	7.48	1165	29.10	102.89	112.26	128.6	149.48	210.73	236.12	286.31	312.80
(c) Loans advanced during the year	16.40	16.70	92.34	328.69	351.58	254.1	299.03	366.14	447.07	509.48	527.10

Note : Data for 1976-77 are provisional.

(Source : *Annual Report of the Ministry of Industry and Civil Supplies, 1974-75*, pp. 390-91; Annual Report of the Dept of Rural Development for 1977-78, pp. 134-135.

mary societies to provide a profitable outlet for their surplus funds. Over-financing, without regard to the repaying capacity of the borrowers, lack of effective supervision, undue tenderness in effecting recoveries even in good seasons, absence of common policy in the regulation of borrowing and lending rates and faulty organisation of the primary units have all added to multiply overdues and bad debts and get the asset frozen.

Weaknesses of the Central Cooperative Banks

The central cooperative banks suffer from certain weaknesses. Some of these are :

1. *Uneven Expansion of credit.* These banks have not provided credit in all states on a uniform basis. This has been due to weak primary structure including inadequate coverage of villages and rural population and presence of a large number of dormant societies.

2. *Defective Loan Operations.* The loan operations of the banks have been defective for many reasons, such as (i) large advances granted to individual members at the cost of primary credit societies; (ii) high operation of bad and doubtful debts; (iii) ill-equipped staff to undertake the duties of the bank; and (iv) undertaking of trading activities by many banks.

3. *Difficulty in Mobilising of Deposits.* Central banks have not succeeded in mobilising savings because of the severe competition from the commercial banks.

4. *Heavy Overdues.* These banks suffer from heavy overdues (about 31% of the loans outstandings). The situation is worst in States like Assam, Madhya Pradesh, Orissa and Rajasthan. This situation is due to poor recoveries, inefficient management, inadequate and untrained staff, lack of supervision, defective loan policies and book-adjustments etc.

The central cooperative banks are not competent to handle such business as the purchase and sale of bills, notes, cheques or hundies their discount since it is risky and moreover, this business is not in keeping with the object of cooperative banking. Hence, these banks are generally not permitted to engage into such business.

Other Problems

- (i) They have failed to establish a close and intimate association with the primary credit societies. (ii) They do not provide adequate loans to industrial consumer and other non-credit societies. (iii) They have failed to work as a friend and guide to the societies for they have not been able to offer them guidance in the matter of sound operational policies. (iv) Quantitatively their position has been highly unsatisfactory because in many states 'A' type banks do not exist at all, while in other 'C' type predominates. (v) There is no adequate provision for effective supervision and utilisation of the loans advanced.

ced. Further, loans are not given in instalments and no efforts have been made to link credit with marketing. (vi) Sometimes, huge amounts have been kept with commercial banks by way of call deposits in addition to current accounts. This system is in utter disregard of the cooperative principles and need be discouraged. (vii) Filing of complaints for award against wilful defaulters and prompt action for the execution of awards obtained have been often found wanting in many cases. (viii) Book adjustments are made in order to inflate the percentage of recoveries. (ix) Margins are not properly regulated in case of fluctuation of prices of the pledged produce. (x) Sometimes, the stocks pledged with these banks are not properly stored and insured.

The *All India Credit Survey Committee* has observed. "In general, the staff employed by the central cooperative banks was ill-equipped for the nature of duties they had to perform. Planting of favourites in cooperative societies was rampant...The maintenance of registers and books leave much to be desired. These are not kept up to-date and are not properly checked by higher officers. In many cases statements sent to the R.B.I. and to the Registrar are misleading and some times incorrect. The staff employed by these banks for supervision of the primary societies is inadequate. Three tier programmes are not thoroughly scrutinised. Consequently, societies situated in remote areas remain unvisited for months together.

The acid test of the success of the central banks lies not in the growth of banking services they provide in the mofussil areas, but mainly in the extent to which the primaries they finance are taught to become efficient and thrift organisation. On the basis of these tests it appears that in most states the central banks have not proved a success.

Re-organisation Scheme

As of the end of June 1976, 181 C.C.B. were adjudged to be weak requiring special measures for rehabilitation. Regarding plan of the rehabilitation programmes, the RBI has issued guidelines on investigation of overdues, steps for recovery, rationalisation of loaning policies and procedures, mobilization of deposits and time bound programme of development in selected areas.

As Agricultural Credit-Intensive Development Scheme has been formulated with a view to concentrating efforts, on a selective basis, to strengthen the cooperative structure and like the credit programmes with production programmes. Under the first phase of the scheme, 41 districts (including SMFD Agency and DPAP Districts) in 16 States have been selected for intensive credit development in various sectors of the rural economy. Some of the important criteria followed in selecting 4 districts were: (a) the districts which have scope for development and a reasonably strong cooperative structure, (b) the central cooperative bank of the district should not have heavy overdues i.e. (ordinarily these should be less than 40 per cent), (c) existence of SM DA and DPAP scheme, and (d) in the few districts, some parts of the

districts were covered by the Regional Rural Banks. In particular the C.C.B. in these districts will have the main objectives, viz. (i) to improve their organisational and operational effectiveness, (ii) to create an awareness for growth and need for diversification, (iii) to build up own resources and manpower so as to ensure gradual independence from outside help, (iv) to progressively professionalise their managements, and (v) to bring about orientation of policies toward benefiting the common interest of the rural population specially the weaker one.

Suggestions for Improvement In Working

1. **Increase Deposits.** The co-operative banks should try to increase their deposits by: (1) opening their offices in business areas; (2) improving their services to their clients and showing them courtesy; (3) securing deposits from local bodies and educational institutions etc., with the help of the state governments; (4) offering competitive rates of interest; (5) opening more branches; (6) introducing a variety of deposits (like cumulative deposits, pigmy deposits, automatic extension deposits, social security deposits, giant cash certificates, retirement security deposits, recurring deposits, home safe deposits, etc.); (7) simplifying the account opening forms; (8) providing free services for collection of local and outstation cheques, dividend warrants of account holders, interest of fixed deposits, and government securities etc.; and (9) tapping deposits from the urban areas so that adequate funds are available for agricultural development in rural areas.

2. **Improve Loaning Policies.** (1) The banks should re-orient their loan policies on the basis of crop loans system. Loans should be given in instalments and proper link should be established between advancing and repayment of loans with sowing and harvesting seasons. (2) The procedures of advancing loans should be simplified.

3. **Recovery of Overdues.** The banks should draw up a programme of rehabilitation and efforts should be made to recover overdues by all possible methods. The borrowing societies should recover their loans from the members and pay it back to the Central Co-operative Banks.

In order to maintain proper records of fluid resources the Central Co-operative Banks must maintain proper registers and keep them up to date. These registers must be kept on a daily basis.

4. **Other Measures.** (1) The Central Co-operative Banks should maintain adequate liquid resources; (2) an adequate margin should be kept between borrowing and lending rates so as to build a strong reserve fund; (3) proper scrutiny and provision should be made for bad and doubtful reserves; (4) business should be confined generally to short-term loans; (5) separate record should be kept of long term loans--and overdues of principal and interest; (6) in the interest of the efficiency of the organisation properly qualified and

trained personnel should be appointed; (7) adequate investment depreciation reserve should be created to cover the gap between the market value and face value of securities in which banks have invested their funds; (8) adequate provision out of the profits should be made for bad and doubtful debts.

A former Registrar of Co-operatives in Bombay has given a good piece of advice to these banks. He observes: "Their functions can be fulfilled only if the directors have both self abnegation and business capacity. They have to think of their banks not as isolated units but as links in the long strong chain which terminates in the provincial bank on the one hand and in the humblest agricultural credit society on the other. They must seize every opportunity to open branches where they are needed. They must entertain an efficient trained and well paid establishment both in the office and for outside inspection and supervision; they in turn recognise the right and duty of the provincial bank in relation to themselves of exacting correct methods and some supervision."

In sum, there is a necessity for undertaking serious steps for rationalising the capital structure of the Central Co-operative Banks, to strengthen and increase their owned and working capitals to the prescribed economic levels.

APEX OR STATE CO-OPERATIVE BANKS

The State Co-operative Bank is a central institution at the State level which works as a final link in the chain between the small and widely scattered primary societies, on the one hand, and the money market, on the other. It balances the seasonal excess and deficiency of funds and equates the demand for and supply of capital. It takes-off the idle money in the slack season and supplies the affiliated societies and Central Co-operative Banks with fluid resources during the busy season. It is the vertex of the pyramidal structure in a state for the provision of short and medium term credit to agriculturists on co-operative basis.

Objectives and Functions

The chief objectives of the Apex Bank is to co-ordinate the work of the Central Banks, and to link co-operative credit societies with the general money market and the Reserve Bank of India. These banks work as real pivots of the Co-operative movement in the State. They act as potential source of credit for seasonal and emergent needs of their members. Their main functions are :

- (1) They act as bankers' bank to the Central Co-operative Banks in the districts. These banks not only mobilise the financial resources needed by the societies but they also deploy them properly among the various sectors of the movement.
- (2) They co-ordinate their own policies with those of the co-operative movement and the government.

(3) They form a connecting link between the co-operative credit societies and the commercial money market and the R. B. I.

(4) They formulate and execute uniform credit policies for the co-operative movement as a whole.

(5) They promote the cause of co-operation in general by granting subsidies to the Central Co-operative Banks for the development of co-operative activities.

(6) They act as a clearing house for capital i. e., money flows from the Apex Banks to the Central Banks and from the Central Banks to the rural societies and from them to individual borrowers.

(7) They supervise, control and guide the activities of the Central Bank through regular inspections by their inspection staff and rectify the defects in their work. Thus, they act as their friend, philosopher and guide.

(8) They also perform general utility functions such as issuing drafts, cheques and letters of credit on various centres and thereby help remittance of funds.

(9) They collect and discount bills with the permission of the Registrar.

(10) In certain places they also provide safe deposit lockers and facilities for safe custody of valuables.

(11) They help the state Governments in drawing up Co-operative development and other development plans and in their implementation.

The Reserve Bank of India has mentioned the following functions of the State co-operative banks : "The State co-operative bank is the apex bank of the movement in a state. It acts as the clearing and balancing centre for the Central banks by transferring surplus funds of one locality to another serving as a channel for the remittance of funds. It also attracts funds for the movements at lower rates and from a wider area than is possible for the Central banks and invest the surplus funds of the Central banks into the commercial markets, when necessary with greater facility than they would manage to do themselves. The State Bank may also co-ordinate the working of co-operative central and urban banks in the State in such matters as the borrowing and lending rates, the rates for collection of various documents, besides advising the banks generally in regard to the efficient conduct of their business."

In the words of Wolff, "The underlying idea of this financial distributory system is that the resources of the society are available to thousands of small cultivators who need accommodation thinning out of stream of water collected, sending it in rills over a broad surface so that irrigation may be perfect and reaching every root to be watered."

These banks are playing a major role in guiding the Central Cooperative Banks, supervising their work and raising resources for the co-operative banking system.

Area of Operation

Generally, there is only one Apex Bank in each State but some States even have more than one as in Maharashtra, M. P., Punjab and Andhra Pradesh. In 1976-77, there were 26 State Co-operative Banks in the country as against 15 banks in 1950-51. These banks had 125 branches.

Membership

Membership of these banks is open to all Central Co-operative Banks, and such other societies as may have direct dealings with them. In some states, e. g., Tamil Nadu, Maharashtra, and Bihar individuals are also allowed to become members. However, individual membership is now fast declining (from 11,743 in 1955-56 to 8,500 in 1972-73). State Governments have now become share holders of these banks in order to give them the necessary strength, influence and borrowing power.

Management

The main authority of these Banks rests in the general Body. Powers of day-to-day working are given to the Board of Directors. The Government, in its capacity as a share-holder, nominates some directors (3 to 4). The General Body meets once in a year when it transacts these businesses ; (i) receives and approves a report of the year's work ; (ii) decides how surplus is to be utilized ; and (iii) elects the Board of Directors.

Sources of Finance

The primary sources of the working capital of these banks are the share capital reserve fund, deposit from members and non-members; borrowings from Reserve Bank of India, State Bank of India, State Governments and others ; and the direct State contributions. The share capital of these banks increased from Rs. 18.24 crores in 1960-61 to Rs. 37.69 crores in 1968-69, to Rs. 54.25 crores in 1973-74 and to Rs. 90.79 crores in 1976-77. This increase was largely due to liberal government contribution towards the share capital of these banks. (It increased from Rs. 6.46 crores to Rs. 11.60 crores to Rs. 19.34 crores and to Rs. 23.75 crores respectively during these years).

Deposits are obtained from members as well as non-members, individuals and companies and also from local boards, municipalities and educational institutions, in the form of current savings, fixed and call deposits. They also include reserve fund deposits of affiliated central banks and societies, provident fund deposits of employees and security deposits. The Central Banks keep their surplus funds as a part of their working capital with these banks. The total deposits of these banks increased from Rs. 72.33 crores in 1960-61 to

Rs. 215.63 crores in 1968-69 to Rs. 473.34 crores in 1973-74 and to Rs. 805.28 crores in 1976-77.

Borrowings are in the form of deposits from the public in the shape of current saving and fixed deposits, and direct borrowings in the form of loans and advances against agricultural bills or government guarantee from the Reserve Bank of India, the State Bank of India, and the State Governments. The ceiling on borrowing varies from 12 times the owned funds to 20 times. The borrowings from the R. B. I. are the largest. The rate of interest charged by it on short-term borrowing is 2 per cent below the bank rate and medium-term loans at 1 1/2 per cent below the Bank rate. The R. B. I. provides loans to these banks for short-term and medium-term purpose. The State Bank of India provides loans for marketing and processing societies, consumer co-operatives and for financing procurement of food grains. Overdraft facilities are also granted against government securities, by the State Bank of India for financing their affiliated societies.

From the year 1972-73, the R. B. I. has started sanctioning a separate credit limit for marketing of crops to these banks. During 1972-73, the total credit limits sanctioned amounted to Rs. 52.83 crores for marketing of cotton and other crops as against Rs. 40.58 crores in 1973-74. This limit sanctioned to the State Co-operative Banks was of the order of Rs. 696 crores in 1976-77.

The Apex Banks maintain various types of *reserve fund viz.*, the statutory reserve fund, bad debt reserve fund, and agricultural credit stabilisation fund, etc. The reserve funds of all kinds increased from Rs. 2.66 crores in 1960-61 to Rs. 57.17 crores in 1971-72.

Loaning Policy

According to the All India Rural Credit Survey Committee, "the demands for agricultural credit should be given top priority ; and loans to individuals should be gradually restricted." Financing may be done primarily for agricultural purposes in the form of loans, cash credit and/or over-drafts. A borrowing Central Co-operative Bank is required to deposit old shares in the State Co-operative Bank to the extent of 1/20 of its borrowings.

The Apex Banks provide short-term loans (for a period of 12 months) not only for financing agricultural operations but also for marketing of crops and distribution of controlled commodities. Medium-term loans are granted for purchase of cattle and machinery, reclamation of land, sinking and renovation of irrigation walls, tank and channels : bunding, enclosures and fencing, construction of farm-sheds, godowns ; laying down gardens and orchards ; replacement, repairs and renewals of machinery and equipment.

Loans are granted to the member societies mostly through their branches. The amount of all types of loans increased from Rs. 258.20 crores in 1960-61 to Rs. 798.52 crores in 1968-69 ; to Rs. 1161.91 crores in 1973-74 and to Rs. 1717.08 crores in 1976-77.

The rate of interest charged shows a wide variation from State to State, the average lending rate for short-term advances ranges from 4 1/2 per cent to 8 per cent and that for medium-term slightly higher.

Cash credit may be sanctioned on the pledge of agricultural produce/finished or semi-finished goods and stores and supplies ; government promissory notes, central land mortgage banks, debentures, Treasury Certificates, National Savings certificates, National Savings Bonds, to the extent of 90 per cent of the market value ; and society bonds and cash credit arrangements endorsed by a Central Bank.

Loans may be given for 6 months against fixed deposit receipts to any holder at the rate of 90 per cent and at a rate of interest 1 1/2 per cent higher than the rates allowed on such deposits.

RESERVE BANK OF INDIA AND THE STATE CO-OPERATIVE BANKS

Since 1950, the R. B. I. is playing an important role in the field of agricultural credit. According to the Agricultural Credit Board (of the R. B. I.) the new scheme came into operation from 1st July, 1973. The salient features of which are :

(a) The R. B. I. grants financial assistance to the State Banks on behalf of the Central Banks for seasonal agricultural operations at 1/2 per cent below the Bank rate ;

(b) The highest level of borrowings from the R. B. I., during any of the 3 years (ending June, 1973) is deemed as 'Base level' borrowings and a rebate of 1 1/2 per cent in interest is allowed on borrowings upto this extent.

(c) Special concessional rebate of 1 1/2 per cent upto 4 times the Central Bank's involvement is given in cases of low level of borrowings.

(d) Weak and non-viable central banks are exempted from this scheme.

The R. B. I., also sanctions medium-term loans for periods ranging from 15 months to 5 years. These are given out of the National Agricultural Credit (Stabilization) Fund to the State Bank to enable them to convert short-term loans into medium-term loans. Such sanctions totalled Rs. 22.47 crores to State Co-operative Banks during 1973-74 and Rs. 30.50 crores in 1976-77.

The Central Government also provides assistance to the State Co-operative Banks through State Governments, for building up their Agricultural Credit Stabilisation Funds. Total assistance till 1976-77 amounted to about Rs. 30.50 crores.

Evaluation of the working of the State Co-operative Banks

These banks have made fairly good progress. Their numbers, membership and working capital has increased since 1950-51, when there were only 15 such banks. They have been meeting the demands of the Central Co-operative Banks. Some of the Banks have successfully introduced and operated mutual arrangement schemes to facilitate drawing of drafts and collection of bills among the Central Co-operative Banks. However, "Barring two or three States relatively well-developed in this respect, State Co-operative Banks have yet to become effective units of a co-ordinated structure of co-operative credit."

Working of the State Co-operative Banks

Items	1951- 52	1955- 56	1961- 62	1970- 71	1975- 76
1	2	3	4	5	6
No. of Banks	16	24	21	26	25
Membership	23,272	24,651	30,468	18,595	19,133
Share capital (Rs. lakhs)	190	427	2,126	4,263	6,346
Reserve & other funds (Rs. lakhs)	236	765	759	5,006	5,717
Deposits (Rs. lakhs)	2,118	3,667	8,144	27,870	70,805
Other borrowings (Rs. lakhs)	1,127	1,902	14,570	29,445	27,009
Working capital (Rs. lakhs)	3,672	6,334	25,609	68,521	73,106
Loan advanced gross (Rs. lakhs)	5,522	6,786	25,629	74,75629	235,936
Loans outstanding (Rs. lakhs)	2,001	3,478	19,651	53,427	55,274
Loans overdue (Rs. lakhs)	322	370	810	3,587	3,834
Percentage of overdue to outstanding	12.01	10.65	8.00	8.48	7.3

(Source : *India*, 1975, p. 195.)

In 1976-77, there were 26 state co-operative Banks with a share capital of Rs. 90.79 crores of which Rs. 23.75 crores were contributed by the Government. Deposits amounted to Rs. 805.28 crores ; and loans and advances made were of the order of Rs. 1717.08 crores.

Problems and Weaknesses in the Working of State Co-operative Banks

The State Co-operative Banks do suffer from the following weaknesses :

(i) **Poor Deposits Mobilisation.** These banks have not been successful in raising deposits as even now; individual deposits form less than 25 per cent in many States.

(ii) **Ineffective Supervision and Inspection.** Many of the Banks have not taken up this work in right earnest. Some of the banks have neither adequate nor separate staff for this work. Officers of these Banks sometimes pay only ad-hoc and hurried visits.

(iii) **Book Adjustment.** Book adjustments are often made regarding repayment of loans. The State Co operative Banks have failed to check the fictitious transactions of the Central Co-operative Banks.

(iv) **Undesirable Investment of Funds.** Despite the advice of the R. B. I., a cautious policy is not being followed in the matter of investment of the funds which are even now utilised for the purchase of shares in other co-operative institutions ; or in making huge advances to the primary co-operative societies ; and by way of loans to individuals.

(v) **Increasing Overdues.** The overdues of the Banks have been showing a rising trend. This is due to the fact that these banks have not followed the prescribed loaning procedure.

(vi) **Failure to Assess Genuineness of Borrowing.** The banks have failed in assessing the genuineness of the borrowings of the Central Co-operative banks. This is evidenced from the fact that the credit limits of such banks had been fixed on the basis of the owned funds without taking into account their past performance ; and the bank's own financial position.

Suggestions for Improvement

1. **Opening of Branches.** In areas where a Central Co-operative Bank is virtually inoperative and, therefore, unable to finance the agricultural credit societies, the State Bank should establish a branch and finance the creditworthy societies till the Central Bank is organised.

2. **Wide Membership.** The membership of the Bank should be open to all Central Banks and such other co-operative credit institutions as may have direct dealing with it. Restrictions should be imposed on the individual membership.

3. **Qualified Managerial Personnel.** Managers of these banks should be qualified and trained personnel. No co-operative should be allowed to begin operations until a qualified manager is appointed who commands the confidence of the people and is able to build the organisation.

4. Withdrawals of privileges for Non-cooperation. Central co-operative banks which refuse to cooperate with the State Bank in the matter of supervision and inspection, should be disaffiliated from the State Co-operative Banks and denied all privileges by the administration.

5. Effective Supervision. The State Co-operative Banks should try to : (i) improve their operational efficiency ; (ii) exercise effective control over branches and the supervisory staff, and (iii) make sustained efforts for the recovery of loans.

6. Other Measures. These banks should also make efforts to : (i) implement and accept policies regarding re-organisation of the structure ; (ii) adopt the co-operative loan system ; (iii) reduce the overdues ; and (iv) improve the personnel.

LAND DEVELOPMENT BANKS

Land Development Banks are the institutions which provide long term finance to agriculturists for agricultural credit needs—which may be for seasonal agricultural operations as well as for various long-term needs for development of land and agriculture. These banks, in fact, provide finance for three main purposes, viz., the repayment of the old debts, purchase of land, undertaking land improvement measures and redemption of mortgage on agricultural land. Such loans are comparatively large and may run for 10 to 15 years and even more.

Need for Land Development Banks

The need for such banks arose because of the following reasons :

(i) Primary credit societies, because of their poor resources, could not give loans to the cultivators for long periods

(ii) These societies also did not possess expert assistance for valuation, title deed etc., so that assessment of landed property becomes difficult.

(iii) The abolition of zamindari system and the restrictions put on the dealings of money-lenders made it difficult for the cultivators to get long-term loans for their needs.

(iv) Increase in agricultural production and productivity of land required long term finance which were not available from the commercial banks till recently.

As a result of these, the necessity for developing Land Development Banks was felt.

Organisational Structure

Land Development Banks are organised on cooperative basis. The structural pattern of these banks fall into one or other of the following categories :

1. *Federal types* under which the Central Land Development Bank works at the top level and the Primary L.D.B., at the base level. This type of pattern is available in Andhra Pradesh, Assam, Haryana, Kerala, Karnataka, Maharashtra, Punjab, Rajasthan, Tamil Nadu, and W. Bengal.

2. *Unitary type* under which the Central L. D. B. advances loans directly to individuals operating through branches and agencies. This pattern prevails in Bihar, Gujarat, Jammu and Kashmir, and U.P.

3. The Central L. D. B. operates through branches as well as primary L.D.B.

Primary L. D. Bs. are generally organised to serve the whole of the district or a group of *talukas*; while *Central L. D. Banks* open their branch offices at the regional or district level with a view to centralising their administrative functions. It may be stated that L. D. Bs. have a two-tier structure in most States with Central L. D. Bs. at the state level and Primary L.D. Bs. at the block|tehsil|sub-division|district levels.

Objectives and Functions

The main objectives of Central L. D. Bs. is to provide long-term finance either to the primary land development banks affiliated to them or to finance directly through their branches. These banks also undertake the following functions.

(1) To grant loans to Primary L. D. Bs., or to individuals through their branches on the mortgage of un-encumbered property to which the borrower member has a clear title.

(2) To float debentures for raising necessary funds for which the State Governments guarantee for the repayment of principal and interest.

(3) To establish branches/sub-offices or new primary L. D. Bs., to facilitate its business.

(4) To acquire immovable properties and construct buildings.

(5) To encourage the spirit and practice of thrift, mutual help and self-help in the members.

(6) To act as a link between the long-term banking and the R. B. I., and the government.

(7) To mobilize rural savings and to stimulate capital formulation in the agricultural sector by the issue of debentures.

(8) To protect the farmers from the atrocities of the money lenders and from the alienation of land to help them in effecting permanent improvements on their lands.

(9) To supervise and inspect and guide the Primary L. D. Bs., and verify utilisation of loans.

(10) To form all such functions as may be conducive to the funds fulfilment of the above objects.

These banks usually grant funds for : (i) redemption of the old debts ; (ii) improvement, reclamation and development of land ; (iii) purchase of agricultural machinery and equipments ; (iv) other productive purposes like sinking and repair of well ; and (v) redemption of mortgage on agricultural lands.

On the recommendations of the Rural Credit Survey Committee greater emphasis has begun to be given on reorienting their loaning policies and to encourage loans for productive purposes. Hence, the original name "*Land Mortgage Banks*" was changed to "*Land Development Banks*". In fact, *the C. L. D. Banks is the axis around which the entire long-term banking structure in the country revolves.*

Area of Operation

The area of operation is usually neither too large as to become unwieldy nor too small as to be uneconomic or non-viable unit. In states like Maharashtra, Tamil-Nadu, and Karnataka the banks work at *taluka* level. In other states, Primary Land Development Banks serve the whole of the district or a group of talukas. In states like Karnataka and Tamil Nadu, Central Land Development Banks have opened branches at district levels. Only Gujarat has branches extending upto taluka level or even below. U. P., about half the number of branches of the central L.D. Bs., serve one tehsil each and the remaining longer areas.

Management

The management of the L. D. Bs., vests in a Board of Directors consisting of 7 to 9 members. In some States 2 to 3 directors are nominated by the Government. In the case of Primary L. D. Bs., one Director is nominated by the Central L. D. B. The members of the Board work for 3 years.

Financial Resources

The primary land development banks obtain their finances from (i) share capital ; (ii) loans from central L. D. Bs. ; (iii) admission and other fees ; (iv) grants and subsidies from the government and (v) borrowings from other agencies.

On the other hand, the Central L. D. Bs. get their funds from (i) share capital ; (ii) floating of debentures on the security of its assets and of mortgage bonds transferred by primary L.D.Bs., to it ; (iii) loans from State Bank of India on the guarantee of State Governments, (iv) admission and other fees ; (v) grants and subsidies ; (vi) deposits and (vii) other funds.

Mostly the work of raising funds is left to the Central L.D.B. The Primary L.D.B. neither accepts deposits nor issues debenture.

The primary L.D. Bs. raise their share capital by issuing shares to the members in certain proportion to their borrowings from the Bank. In most States, the linking of share capital borrowings at primary levels is 5 per cent of the loan taken. In Maharashtra it is 10 per cent.

The C. L.D. Bs. raise sources mainly through issue of ordinary rural and special development debentures. The *ordinary debentures* are issued to the general public institutions and individuals. These are treated as trustee securities and are guaranteed by the State Governments. These are subscribed by the R. B. I., S. B. I., Co-operative Banks, Commercial Banks and the L. I. C. Ordinary debentures were floated to the tune of Rs. 100 crores in 1968-69 ; Rs. 113 crores in 1969-70 and Rs. 140 crores in 1970-71. In 1973-74, debentures worth Rs. 74.97 crores were floated. During 1975-76, 1976-77 and 1977-78, the ordinary debentures floated were worth Rs. 75.48 crores, Rs. 80.28 crores and Rs. 120 crores respectively.

Rural Debentures are floated to raise funds for sanctioning loans to agriculturists for productive purpose for a period of 6 to 7 years against the mortgage of land. Much progress could not be made in this respect.

Special Development Debentures are issued for providing finance to the agriculturists under special agricultural development or land improvement programmes. In 1977-78, special debentures worth Rs. 190 crores were floated as against Rs. 144.89 crores in 1976-77, Rs. 114.35 crores in 1975-76, and Rs. 83.30 crores in 1973-74, Rs. 10.62 crores in 1960-61. The commercial banks, State Bank of India, Life Insurance Corporation of India are the main agencies which invest in these debentures. The State and Central Governments also subscribe to these debentures. During 1972-73, a sum of Rs. 12.51 crores and during 1973-74, a sum of Rs. 7.38 crores was invested by the Central Government in the debentures and the State Government's contribution amounted to the matching investment. During 1974-75, Rs. 6.99 crores and in 1975-76, Rs. 5.96 crores were invested by the Government of India. From 1976-77, the Central Government also started investing in the special debentures. It invested Rs. 9.80 crores in the debentures of L. D. B. (of which Rs. 3.86 crores were for special debentures). For 1977-78, a provision of Rs. 17.50 crores has been made. Till the end of December, 1977, the Central Government invested Rs. 4.27 crores in ordinary and Rs. 66.5 lakhs in special debentures of L. D. B.

Loaning Policy

The C. L. D. Bs. provide 70 per cent of their loans for productive purposes. Loans are advanced for periods ranging between 10 to 20 years. In some states, it is 7 years, in others, 12 years and yet in others 15 years.

The maximum amount of loan that a member is entitled to get from the C. L. D. Bs. varies from state to state, ranging from

Rs. 10,000/- to Rs. 25,000/-. The loans are given on the mortgage of un-encumbered property to which a borrower has a clear title. Lands offered as security may be wet lands (having permanent source of irrigation), garden lands (the land on which perennial or seasonal fruits are grown), well irrigated dry lands (i. e. lands irrigated by pucca wells) and dry lands (i. e. land fed by rains).

The C. L. D. B. have the power to recover their loans by (i) distraint and sale of produce and standing crops on hypothecation ; and (ii) sale of their mortgaged land itself without intervention of the court.

The rate of interest charged differs in different States. The rate of interest charged by the C. L. D. Bs., is 1 per cent higher than the rate repayable on debentures. The P.L.D. Bs. keep a margin of 1 to 1 1/2 per cent and hence, their lending rates are higher than the C.L.D. Bs. As most of the C.L.D. Bs. issue debentures at 5 1/2 per cent to 6 1/4 per cent the ultimate rate of interest paid by the farmers ranges between 7 per cent to 9 per cent per annum.

There has been a steady progress in the loaning business of L. D. Bs., the total loan disbursements raising from Rs. 11.82 crores in 1960-61 to Rs. 215 crores in 1975-76. In 1976-77, the loaning operations reached Rs. 231 crores. The tentative programme of long-term lending for 1977-78, is expected to be Rs. 138 crores under ordinary and Rs. 190 crores under special lending programmes.

The lending programme of the L. D. Bs. is fixed on the basis of their past performance in recovery at the primary/branch level. Recovery of over 75 per cent entitles the primary/branch to be "unrestricted" lending while a recovery of less than 40 per cent reduces the programme to nil. The Debenture Norms Committee in the R. B. I. regulates the application of the norms of recovery on a uniform basis for all lending programmes of the L. D. Bs. On the basis of deliberations of this Committee, certain relaxations in the application of above criteria have been laid down, some of which are :

- (i) After 30th September 1978, only P. L. D. Bs./branches of S.L.D. Bs. which had achieved a minimum cash recovery of 65 per cent shall be eligible for refinance from the A. R. D. C.
- (ii) A P. L. D. B. branch of S. L. D. B., which has restricted eligibility and as out of the permitting lending, disbursed at least 50 per cent of the amount to small farmers would not be permitted to go one slab above the level of lending determined on the basis of the criteria. This is subject to the condition that 75 per cent of the additional amount so permitted should be advanced for financing small farmers.

- (iii) A P. L. D. B./branch of S. L. D. B., which has shown improvement in recoveries to the extent of at least 5 per cent over the previous year but not exceeding to enable them to be placed in the higher slab, would be entitled to 5 per cent additional lending programme.
- (iv) There is also a provision for reviewing the level of recovery performance of the banks/branches as at the end of December 1977
- (v) Other relaxations relate to the disbursement of committed expenditure towards the second and subsequent instalment of loans ; the basis for calculation of the eligible lending programme and also that for these branches of S.L.D.B P.L.D.Bs. operating in areas affected by drought or other natural calamities.
- (vi) The L. D. Bs. might segregate overdues of 5 years or more into a separate blocked account and exclude the same from the total overdues while calculating the percentage of overdues to demand subject to the condition that at the end of 5 years the entire amount put in the blocked account will have to be fully recorded or overdue cover provided for the same by the bank.

With the phenomenal increase in the long-term credit support extended by the L.D. Bs. for investment in agriculture, the percentage of overdues had been fluctuating. At the apex level, the percentage of overdues had declined from 45.4 in 1973-74 to 38.00 in 1975-76. At the primary level, it has declined from 31 per cent to 28 per cent during this period.

Growth and Development of Land Development Banks

Attempts were made in India as far back as 1883 to provide financial facilities when the L. D. B. of India was started on the model of the *Credit Foncier de France* but the bank could not succeed because of over-investments without the necessary safeguards. A land mortgage bank was registered on 30th June, 1920 at Jhang in Punjab but it has had a chequered history.

The period from 1920 to 1929 may be called the period of experimentation and unplanned growth. During this period, land mortgage banks were organised under the Cooperative Societies Act in Punjab, Madras, Mysore and Bombay. Assam and Bengal developed them to a very limited scale. By 1930, there were 42 of them. By 1929, a Central Land Mortgage Bank started functioning and had a membership of 19 functionaries. In Bombay three Land Mortgage Banks were organised in 1929. Mysore had started Central Land Mortgage Bank and several primary banks in the same year.

The period, 1930-39 was one of trials and tribulations for the land mortgage banks which were just beginning to function. They were organised practically in all the major provinces. Towards the

middle of 1939 there were 226 land mortgage banks with a membership of 80,000.

The period, 1939-50, comprised the war and the post-war period. The war period was comparatively one of stability for the land development banks. Since then the number of the Central and Primary Land Development Banks increased to 5 and 286 in 1950-51, to 18 and 463 in 1960-61, to 19 and 740 in 1968-69, to 19 and 856 in 1973-74, and to 20 and 893 in 1976-77. Their membership rose to 34,579 and 213,814 in 1950-51 and 216-500 and 550,395 in 1960-61 and to about 300,000 and 900,000 in 1973-74.

The L.D.Bs. have specially liberalised their policies in favour of small and Marginal Farmers by providing easier repayment periods, lower percentage of loan payment, liberalised share capital ratios and eligibility on the basis of incremental income.

Recent Developments

The L.D. Bs. have been re-orienting their policies and procedures from the earlier security oriented system to an investment analysis system. The *Committee on Co-operative Land Deve. Banks* had made detailed suggestions for improving the loaning policies and procedures. The *Committee on Integration of Co-operative Credit Institutions* has recommended the integration of the two wings of the co-operative credit structure at all levels, i.e. primary intermediate (direct) and apex (state) in a phased manner. The Committee has also suggested a pattern of effecting integration. the legal framework and amendments to bye-laws of co-operative credit institutions and other relevant Act.

Evaluation of the Working of the Banks

These banks suffer from certain drawbacks :

1. **High Overdues.** The main factor inhibiting the growth of land operations of these banks is the high incidence of overdues. In 1976-77, the loans outstanding stood at Rs. 1117.52 crores, as against Rs. 919.15 crores in 1973-74 ; Rs. 402.15 crores in 1968-69; Rs. 37.74 crores in 1960-61 and only Rs. 6.59 crores in 1950-51.

The position of overdues exceeded 50 per cent of the demand in Assam, Rajasthan, Karnataka, M. P., Orissa, Maharashtra, and West Bengal. Even in other states, the situation was not satisfactory. The inadequate staff, less use of coercive measures for recoveries, the repeated failure of rains and drought conditions in most parts of the country have been the main causes for high overdues.

2. **Uneven Development.** The development of L. M. Banking has not been uniform in all the states. There are at present 20 States Co-operative Land Development Banks, one in each state (excepting Manipur, Meghalaya, Nagaland and Sikkim with 1714 branches affi-

The total loan disbursements of the land development banks increased from Rs. 1.38 crores in 1950-51 to Rs. 11.26 crores in 1960-61 and to Rs. 181.14 crores in 1973-74.

LAND DEVELOPMENT BANKS (All India trend)

Item	1950-51	1955-56	1960-61	1968-69	1969-70	1970-71	1973-74	1974-75	1975-76	1976-77
1. (a) No. of Banks.										
1. Central.	5	9	18	19	19	19	19	19	19	20
2. Primary:	286	302	463	740	809	865	857	872	890	893
(b) No. of branches of C. L. D. B.	NA	NA	NA	469	484	518	812	630	648	668
2. Loans advanced during the year to individuals :										
(Rs. crores)	1.38	2.86	11.62	148.16	155.48	170.44	150.09	180.76	215.36	242.31
3. Loans outstanding with the individuals										
(Rs. crores)	6.59	13.47	37.74	402.15	513.23	636.51	914.53	983.46	903.31	1117.52
4. Debentures issued during the year.										
(Rs. crores)	NA	NA	10.62	130.64	151.97	158.44x	161.33	155.17	189.17	210.11

Note : x includes debentures issued by Delhi State Co-operative Bank.

N. A.—Not Available.

(Source—*Annual Report of the Ministry of Industry and Civil Supplies*, 1974-75, p. 394 ;and *Annual Report of the Department for 1977-78* pp. 136-137.)

liated primary land development banks operating at the district/taluka/block level. From the point of view their number, membership, loans granted, owned funds or profits, it is found that good progress has taken place in certain states while in others it has been quite poor. In many states (such as W. Bengal, Assam, U. P., Punjab, and Rajasthan) less than 2 per cent of the cultivating households have become members of these banks. In other states the proportion of members joining these banks is very low. In many states, the banks have not yet reached the tehsil level.

3. Management Structure not Uniform. Despite the fact that almost all the banks are co-operative societies, the management structure is not uniform. This has been due to ; (i) absence of elected representatives of the members on the Managing Committee of the land development banking section in the case of Central Banks operating as agents of the Apex L. D. Banks ; (2) irregular meetings of these Committees or Boards ; and (3) lack of interest in the working of the institutions on the part of the members of these bodies including the official nominees.

4. Inadequacy of Funds. The Banks suffer from inadequacy of funds. More than 80 per cent of the working capital of almost all the banks consist of borrowed funds. The small business turnover, due to inadequacy of finance, make it difficult for the banks to employ adequate and experienced staff for scrutiny of loan applications and supervision over the utilisation of loans.

5. Delay in Granting of Loans. There is a great delay (often of 6 to 9 months) in sanctioning and granting of loans. The causes of delay at the sanctioning stage are : the ignorance and lethargy of the borrowers in respect of submission of the loan applications and relevant documents ; lengthy and time-consuming process that is taken in the scrutiny of titles ; lack of frequent meetings by the management and lack of full authority with the managing committee to sanction loans for higher amounts ; and the non-compliance of conditions stipulated in the loan sanction orders.

6. Defective Loaning Operations. The procedure of determining the loan eligibility of a farmer is still security oriented rather than production-oriented. There is no uniform policy for assessing the repaying capacity of the borrower and the value of the land. In most of the states the cost of improvement and incremental income due to the proposed improvements are not taken into account.

7. High Cost of Credit. A serious defect of the L. D. Banking is the high cost of credit which does not permit the farmer of ordinary means to take advantage of such credit. Cost of credit comprises interest and share of charges to be borne by the borrower at the time of taking loans ; flat fees made to cover the administrative expenditure incurred in making out legal forms ; the cost of searching

records for determining whether the security offered is free from encumbrances and the cost of recording the credit instruments such as mortgages on the books of the primary banks.

8. Lack of Supervision and Inspection. The machinery for supervision is not only inadequate in most of the States, but in many P. L. D. Banks, even the secretaries and managers are generally untrained and the Directors have not the necessary experience and ability to manage and guide the affairs of the banks effectively. Thus, "there is an utter lack of administrative and supervisory staff of right type and the requisite scale. Therefore, a full check on the utilization of loans is rather difficult."¹

9. Non-viable Units. Many of the banks are not viable units. To be a viable unit with an average margin of about 1 1/2%, a primary L. D. Bank should have a minimum business of Rs. 20 lakhs. Larger number of primary units do not satisfy this criterion.

10. Small Farmers not Benefitted. These banks have not been able to benefit the small and medium sized farmers. A large majority of the loans, according to the All India Review Committee, have been obtained by those who have more than five acres of land.

11. Unhelpful Attitude of the Registrars. In many States, the unhelpful and non-cooperative attitude of the Registrars/sub-registrars, has also affected the efficient working of these banks, as undue delays in granting Encumbrance Certificates has led to delay in scrutiny of the applicants and the grant of loans.

Suggestions for Improvement of Working of the Banks.

(1) The structural pattern of the banks should be made uniform throughout the country. There should be one Central L.D. Bank at the State level and one Primary L.D. Bank at *taluka* level. The area of operation should be such that a bank may have close contact with the borrower and it may be a viable unit.

(2) These banks should have trained field staff so that they may have direct contact with their members.

(3) Proper supervision should be provided over the primary units on processing and sanctioning of loans.

(4) Loaning policies should be reoriented and loans should be production-oriented rather than security-oriented.

(5) The State Government should guarantee the payment of principal and interest on debentures of Central L.D. Banks; provision of staff for valuation of land and examination of schemes of land development; exemption of stamp duties and registration fee; provision of over-draft facilities; special assistance to these banks in under-developed areas so as to enable them to meet their administrative cost etc. should be granted to these banks.

1. *All India Rural Credit Review Committee Report*, p. 795.

(6) L.D. Bs. should make efforts to mobilise savings in rural areas by way of attracting contributions from cultivators and sale of debentures to rural cultivators.

(7) Success of Land Development Banks depends on accurate land valuation offered as security and the determination of the annual repaying capacity of the borrower and recovery of loans punctually.

(8) Delay in granting of loans can be removed : (i) if the applicants are trained in advance at the primary level about the requirements and procedures of loan applications ; (ii) the time taken in routing the loan applications at various stages is reduced to the minimum ; (iii) the procedure for getting loans should be given wide publicity ; (iv) full cooperation should be extended by the Government departments in the form giving first priority to the provisions of information and documents required by the banks ; (v) the eligibility of the borrower, from the legal point of view, must be judged before other assets of adequacy of the value of security and of repaying capacity are applied.

(9) Timely recoveries and repayment position may be improved by emphasising upon : (i) prompt recovery of repayment on due dates ; (ii) better supervision and arrangements for verification of the use of loans ; (iii) fixing the dates for the repayment of instalments to coincide with the harvest of the major crops ; (iv) launching a recovery drive well in advance ; (v) refusing grant of further funds, for making new loans, to P.D.D.B. which have overdues in excess of a particular level.

(10) To mitigate the adverse effects of land reforms and land legislation, the V. L. Mehta Committee has provided with these measures : (i) The State Governments should give a definite assurance to the effect that the losses suffered by these banks will be made good ; (ii) occupancy tenants and tenants in the process of becoming land-owners should be given the right to mortgage or give their occupancy rights to a co-operative society, (iii) restrictions on the sale of land should not be made applicable to the cooperative institutions ; (iv) land reform legislation should be enacted as quickly as possible to remove uncertainties regarding the title, etc ; (v) restrictions on ceiling of agricultural holdings should not be made applicable in respect of land which comes into the possession of cooperative financing agencies and (vi) the mortgages executed in favour of these banks should be given priority over any claim of government arising from *takkavi* loans, granted after the execution of such mortgages.

(11) For proper coordination between short and medium term credit and long term credit, the informal Group on Institutional Credit has suggested that : (i) the L.D. Bank should lend their full support to the apex bank by investing the permissible part of their sinking fund in fixing deposits in the latter ; (ii) the Apex Banks, in turn may support the C.L.D. Banks by investing in its ordinary debentures and also by providing interim accommodation : (iii)

services of the State and Central Government may be utilized by the C.L.D. Banks in expeditious disbursement of loans and also for canvassing support for the rural and other debentures.

(12) For the mobilization of rural savings and other resources the suggestions of the All India Rural Credit Survey Committee are worth noting: (i) these banks should be able to mobilize rural savings in these areas where development is in progress ; (ii) the size of the supported programme of ordinary debentures for each C.L.D. Bank should be related to the volume of resources raised by it through rural debentures ; (iii) the C.L.D. Bank must give some incentives to the persons entrusted with the job of canvassing support to rural debentures ; (iv) a relatively high contribution towards share capital of the banks may be insisted upon in the case of relatively large loans which are normally availed by bigger cultivators ; and (v) the State may also contribute towards the share capital of the P.L.D. banks and the R.B.I. may also sanction long-term loans for this purpose from its National Agricultural Credit (Long-term operations Fund) to the State Governments.

The All India Rural Credit Review Committee's observation may be noted. "The present lending policies and procedures of the land development banks should be reviewed in a comprehensive manner and revised in all necessary aspects so as to bring them in line with the requirements of sound investment credit and to ensure the optimum use of scarce long-term resources. In particular, these banks should look into the technical feasibility of the improvement or investment to be financed. The economic viability of the proposition in relation to the size of holding and the nature of farm business of the borrower, the increase in production and income expected to result from the investment and the repaying so generated, the period for which the loan may be sanctioned and the extent to which the cultivators of different classes may be expected to finance such outlay from their own resources. The land development banks should take up the scheme of rural debentures in right earnest and should make determined efforts to collect rural saving from cultivators."¹

1. *All India Credit Review Committee Report*, p. 775.

Multi-Purpose Societies and Service Cooperatives

MULTI-PURPOSE SOCIETIES

A multi-purpose society is "a society which caters for all the needs of the farmers and not only their credit requirements." According to the Reserve Bank of India, "it is a process or technique of the economic rehabilitation of agriculture and the agricultural producer." The multi-purpose ideal is associated with "Better farming, Better Business and Better Living."

Necessity for Developing Multi-Purpose Societies

The necessity for starting of these societies arose out of the recommendations of the Reserve Bank of India, that :

(1) The credit societies which supply only credit requirements of the members, cannot take a deep interest in the improvement of the lives of their members.

(2) These societies should be reformed and reorganised so as to become centres of the activities of the whole village life.

(3) They should not only be an agency for supplying finance but should influence the all sided development of agriculture and betterment of life of the villager from every point of view.

Objectives and Functions

The objectives of the multi-purpose society were (i) to establish close and continuous connection with the members, and (ii) to encourage constant consultation between members and the society so that welfare of both may be achieved.

These societies try to achieve greater loyalty of members and their full cooperation. They provide an opportunity in the villages to undertake work of social and economic improvement by cooperation.

These Cooperatives (according to the Cooperative Planning Committee, 1946) undertake the following functions :

(1) Finance crop production by way of granting loans for various purposes. (2) Act as an agent for sale of produce to the nearest

cooperative marketing organisation. (3) Supply farmer's simple needs for crop production like seed, cattle feed, fertilizers and agricultural implements and also consumer goods and indent basis or basis of established needs. (4) Serve as milk-collecting station for the market dairy and as a centre for animal first-aid and maintenance of stud-bulls. (5) Serve as a centre for maintaining agricultural machinery for the joint use of members. (6) Encourage subsidiary occupations for its members. (7) Introduce better living methods by checking the members to stop all wasteful litigation and to take interest in removing illiteracy. (8) Take other works of rural reconstruction. (9) Encourage thrift, self-help and cooperation among their members.

Thus, these societies perform the functions of at least three agencies viz, a Bank, an Agricultural supply and sale society; and a supervising Institute.

Membership and Area of Operation

Membership of such society should be open to all persons residing in its area of operation. The society should have at least 50 members. Its area of operation should be such as to permit adequate business, effective supervision and control.

Liability. The liability of these societies is to be limited except in those areas where unlimited liability had produced good results.

Benefits Claimed for Multi-Purpose Societies

A multi-purpose society enjoys these advantages :

(1) As village credit society provides a number of services it will be in more close and continuous touch with its members. Such a touch develops loyalty and interest among the members for the society. (2) As it provides a large number of services it attracts a large number of people who are at present outside the cooperative fold. (3) Such a society helps the members in freeing them from debt and brings them profitable returns for their produce. (4) One society doing all the functions can be easily supervised and inspected. (5) Losses in one section of the society can be easily set off against the profits of the other branches. (6) As the volume of business of such a society is likely to be high, it can employ trained and well paid staff. (7) Such a society leads to an increase in the wealth of an individual villager by effecting improvements in methods of production and marketing and by development of cottage industry.

Demerits of the Multi-Purpose Societies

These societies suffer from certain demerits also, such as :

(1) The concept of a multi-purpose society is difficult to grasp on the part of the villagers, while the idea of a single-purpose society is simple and can be easily understood. (1) It is rather difficult to get competent persons in the villages who can manage all different kinds of businesses which a multi-purpose society is likely to undertake. (3)

Since these societies operate over a group of villages they cannot ensure close, mutual knowledge so essential for the success of co-operation. (4) Mixing up of credit business with sale and purchase business is often very risky. (5) The accounts of different activities are generally mixed up and thus the true position of various activities of the society cannot be known. (6) There are often conflicts of interests in a multi-purpose society. People do not care for activities in which they are not interested. (7) In a multi-purpose society it is rather difficult to supervise proper utilization of loans. (8) The degree of complexity in different activities is different and failure in one may weaken or destroy others if they are organically combined.

Hence, many authorities have not favoured the development of multi-purpose societies.

Growth and Development of Multipurpose Societies

The first multipurpose society was started in 1912 in Kodinar taluka of former Baroda State by Shri Mani Lal Nanawati, the then Registrar of Cooperative Societies. Being encouraged with its success, many more cooperatives were started during and after the Second World War. The Government's policy of revitalising the credit societies was one of the important reasons for the growth of such societies in Assam, Bihar, Karnatak and U. P. These societies were entrusted with the task of distribution of essential commodities to agriculturists and with marketing of their crops. So that the number of these cooperatives increased from 18,162 in 1947-48 to 75,000 in 1957-58. The membership increased from 5.8 lakhs to 43 lakhs and the working capital from Rs. 2.7 crores to Rs. 56 crores; and goods purchased and sold from Rs. 1.63 crores and Rs. 3.5 crores to Rs. 22.6 crores and Rs. 27.8 crores respectively.

The new development plan was put into operation in 1947 which envisaged that a multi-purpose society should be developed in each village and a union in each block, comprising 12 to 15 villages. These cooperatives were to cover every aspect of rural life and to devote their attention primarily to agricultural production. The new policy also emphasised on the registration of multi-purpose cooperatives in preference to single-purpose societies. Accordingly, the policy of converting the single-purpose societies into multi-purpose societies began to be pursued.

Evaluation of the Working and Problems

But, as observed by the Reserve Bank of India Review, "the multi-purpose idea does not seem to have been successfully translated into practice to an appreciable extent in any state. Most of these cooperatives were only doing credit work the non-credit activities being confined to the distribution of commodities. The main reason for their inability to cover a wide range of activities efficiently seems to be inadequate resources, lack of trained personnel leading inefficient management, and lack of interest among members."

The weak performance of these cooperatives has been due to the following factors :

- (1) *Absence of technical personnel for efficient management of these cooperatives.* Due to limited resources, these cooperatives could not afford to employ trained staff.
- (2) *Lack of assistance from financing agencies and the disloyalty of the members* of the cooperatives was another reason.
- (3) *The Cooperatives were not organised on proper lines* and the principles of cooperation were ignored in many cases.
- (4) Such cooperatives did not achieve significant progress because they could not be nurtured automatically.

LARGE-SIZED SOCIETIES

To make the primary societies more useful, the Rural Credit Survey Committee recommended that, "large-sized societies should be developed between the multi-purpose and single-purpose societies. These should combine in themselves credit and some other services, also." They were to be organised as State-partnered societies, the idea being that these would have large membership and adequate resources. This would help them to have sufficient business. They would also be able to employ wholtime and efficient trained staff. For other services needing special knowledge, such as for marketing and processing of produce, separate societies were to be organised. Accordingly large-sized societies were sponsored in the country. The main features of these were :

- (1) The area of operation was to be large, covering a group of villages with a view to have large membership (from 300 to 500 persons) and adequate share capital.
- (2) The liability was to be limited and the societies were to be State-partnered (i. e., in a share capital of Rs. 20,000/- 50 % was to be contributed by the Government).
- (3) They were to provide crop loans and also medium term loans to members for productive purposes.
- (4) Consumption loans were also to be provided to the members and for this purpose chit funds were to be started in each society.
- (5) More deposits were to be attracted so that dependence on borrowed funds could be reduced.

The large-sized societies made some progress but this programme hardly continued for 3 years when the National Development Council decided to stop further organisation of such societies. In their place, *Service-Cooperatives began to be developed.*

SERVICE COOPERATIVES

"The Service cooperative is an organisation of villagers who have willingly combined for mutual help and cooperation in meeting their common economic requirements and increasing agricultural production."

Service cooperatives are the most important agencies for the benefit of agriculturists, and the rural people. These are the voluntary form of organisations formed on cooperative principles in such a way that they provide its members every kind of service they might need in their production activities.

They are in a way multi-purpose societies which assume the total responsibility for economic development at the village level by providing all essential supplies and services necessary for increasing agricultural production.

Objectives and Functions

Their aim is to secure to every family engaged in agricultural production, not only credit but also other supplies necessary for increasing agricultural production. The service cooperatives undertake the following functions.²

(1) To advance loans to agricultural producers, agricultural labourers, artisans or workers ; (i) short-term loans for raising crops for social ceremonies and non-agriculturists may be advanced loans for cottage industries ; (ii) medium-term loans for purchase of bullocks, construction of masonry wells and reclamation of land ; and (iii) long-term loans for effecting improvement of a permanent nature as installation of tube-wells, purchase of machines and payment of old debts etc. (2). To supply different agricultural and other production requirements at fair prices e. g., manures and fertilizers, improved seeds, improved implements, cattle feed/fodder, tools and insecticides on cash and hire either on its own behalf or as an agent. (3) To arrange storage, marketing and processing of surplus agricultural produce and articles of cottage industry. (4) To arrange raw materials for cottage industry. (5) To provide gainful employment to its members. (6) To cater the sanitary needs of the village. (7) To extend facilities of schooling and dispensary. (8) To arrange for repair of implements and tools of the members. (9) To supply consumer goods in common demand (such as sugar, salt, matches, kerosene oil) to village community. (10) To give technical guidance in agriculture and allied subjects. (11) To arrange for the sale of produce of members through marketing cooperatives. (12) To undertake various other tasks such as the full use of the available irrigation facilities ; application of improved agricultural techniques ; promotion of animal husbandry ; production of organic and green

1. Ministry of C. D. and Co-operation, *Service Co-operatives—What and why ?* p. 2,

2. *Ibid.*

manures, dry farming, contour bunding, soil conservation, etc. (13) To create public opinion against wasteful expenditure over ceremonials and promote thrift among the members by insisting on a steady contribution to its share capital. (14) To undertake programmes of welfare, economic and other for the village, and to associate with educative advisory work.

Thus, a multipurpose service cooperative is expected to function as a bank, a store, a supply and marketing organisation ; a distribution agent, and as an agricultural development agency generally.

Chief Features of Service Cooperatives

Service cooperatives should be open to all villagers residing in its area of operation. It should be organised as a general rule, on the basis of the village community as the primary unit.

The National Development Council (in its Resolution of 1958) laid down that ordinarily every single village should have a service cooperative. If the village happens to be too small, two or more villages, with a population of about 1,000 may be brought together. This would mean that in due course a society can have a membership of about 200 and can claim advantages of homogeneity along with a certain measure of economic viability.

1. All cultivating families including tenants and marginal and sub-marginal cultivators should be enrolled as members. To begin with, a society would do well to have 40% of the rural families.

2. Admission fee should be 50 paise and the value of one share Rs. 10. If a member cannot pay share money in one lumpsum; he might pay it in instalments.

3. Liability should be usually limited, but where members want unlimited liability they may also be allowed.

Organisation

Service Co-operatives may be organised in any one of these ways :

- (a) Existing agricultural credit and multi-purpose societies may be converted into service cooperatives by amending the bye-laws ;

- (b) Existing small-sized marketing societies may be converted into service cooperatives by adopting the bye-laws for service cooperatives ;

- (c) Existing unwieldy large-sized credit societies may be divided into several service cooperatives.

- (d) Existing small rural credit societies of unlimited liability may be amalgamated into service cooperatives ; and

- (e) Where there are no societies of the above types, new societies may be formed.

Management

The management of a service cooperative is conducted in the general meeting, which must be held regularly i. e., at least once or twice a year. The Managing Committee looks to the day to day management. It should consist of 5 to 7 members including a chairman, a secretary and a treasurer. The general meetings are used for educating the members in cooperative principles and practices. Each member of the Managing Committee should make himself responsible for particular item of work i. e. credit supply, marketing, accounting, record keeping etc.

Origin and Growth of Service Cooperatives

During the latter part of 1958, the National Development Council decided that large sized credit societies (which were a feature of the Second Plan upto its third year) should no longer be organised. This decision was accepted by the Central Government during 1959-60 and the organisation of large sized credit societies has since then been stopped. Instead, *Service Cooperatives* (usually with an area of Gram Panchayat) began to be organised. For 1960-61 the target was fixed at 28,440. For establishing new societies as service cooperatives it was suggested that certain minimum tests should be laid down for this purpose. At least 25% of the families in the village or 50 persons (whichever is higher) should come forward to join a society. They should be prepared to contribute a certain minimum amount towards its share capital and be willing to contribute further in the next 5 years.

By the end of the Second Plan, 38,975 Service Cooperatives were set up partly by starting new societies and partly by reorganising the existing village cooperatives. During the *Third Plan*, about 30,500 new service cooperatives were to be set up in addition to 53,700 existing Societies which were to be reorganised and revitalised as Service Cooperatives. These were to cover almost all villages and about 75 % of the agricultural population.

During the *Fourth Plan*, there was no definite programme for increasing the number of societies. In fact, the number went down in an effort to set up viable units by amalgamating weaker ones. It was expected that there would be a substantial increase in the number of members so as to cover about 60% of the agricultural families. During Fourth Plan efforts were made to meet the needs of the small farmer in full while those of other only partially.

Evaluation and Problems

The scheme of the formation of service co-operatives was launched about a decade back. But their working shows no substantial progress. This is revealed by the observation of the Rural Credit Follow-up Survey. "By and large, the service co-operatives had not been preceded by any well-planned promotional efforts or proper

understanding of the type of functions to be undertaken by such Societies. The conversion of existing societies into service co-operatives was done in a great haste”.

The small area of operation, low volume of business, inefficient management, lack of trained staff ; and non-viability of the societies have been some of the important factors hindering their growth and development.

Suggestions for Improvement

1. *Every village should have a society*, nearly every family should be represented on it, and that farming and to some extent household needs be met by such society.

2. No village area should be more than 3 or 4 miles distant from the headquarters ; and the population covered should not exceed 3,000. *Area of operation should not be too large.*

3. *Efforts should be made for the promotion of viable units*, of co-operative service and business.

4. *The dormant societies should either be liquidated or revitalised.*

5. The co-operatives should have members on the Managing Committee who not only enjoy the confidence of the members, but also possess competence to discharge their duties in an efficient manner. They should be honest and trained.

6. Each service co-operative should have a wholtime manager/ secretary so that he may be able to devote full attention to the business of the society.

7. Service Co-operatives should enlarge their field of activity not only in providing credit and distribution facilities but should also mobilize deposits and diversify services.

8. There is a need for an honest and efficient administration on whose shoulders can lie the responsibility of creating the necessary 'social change' so valuable for initiating any development process like the formation and expansion of service-co-operatives. Whether it be registration of these institutions, persuasion of people into the benefits of such co-operation, extension of essential advice or services or promotion of like functions. Everywhere administration has to be vigilant, imaginative, efficient and sympathetic.

9. Service co-operatives should be affiliated to the central co-operative bank, nearest marketing society and Supervising Union. Towards the share capital should also be added share capital deposits. Members should be induced to buy one or two shares every year after the harvest. While the supreme power of the service co-operative society should be vested in the general body of all the members, executive power might be delegated at the general meeting. Each member of the managing committee should take upon himself the responsibility of looking after at least one particular function of the co-operative.

History and Growth of Co-operative Movement

Traditional Forms of Co-operation in India¹

Co-operation is not, in any way, new to India. It has been known and practised in this country since time immemorial. In ancient India it took four principal forms : *kula*, *grama*, *shreni* and *Jati*.

“Historically speaking, *Kula* was the first form of co-operative activity that emerged in Indian society.....It was both a political and socio-economic organisation in which kinsmen, friends and relatives worked co-operatively to promote their economic, social and political interests. With the expansion and stabilization of society, the aspects of economic and social co-operation gradually narrowed to the limits of joint family which has survived to the present day. Under this system the land is owned and cultivated in common, while all adult members have to share the duties of the family engaged in the occupations other than agriculture. Members of the family live in a common house and the household expenses are met from the income of the joint property. This institution is based on a feeling of brotherhood and mutual help.

“Co-operation at the level of *grama* emerged after *Kula* became a stabilised unit. The *Gram sabha* was a co-operative organisation which undertook works for the economic and social progress of the village and looked after the improvement and maintenance of village lands, pastures, roads, highways, paths, common gardens and grasslands.....Artisans and cultivators often combined for purposes of co-operative working in their respective fields. The members jointly undertook buying or selling or obtaining equipment, tools, seeds and other items of production.”

“The *shreni* is a later development which emerged in the post-vedic era. It was a co-operative and economic organization of artisans, industrial and handicraft workers, merchants, traders, bankers, agriculturists, house-builders, workers, in construction job and build-

1. Srivastava, G. P. *Traditional Forms of Co-operation in India*, 1962, pp. 1-5.

ing contractors. *Shreni* worked not only as a banker and merchant guilds but also as charitable institutions."

"Co-operation at the level of *jati* was mostly for social purposes as education, charity, and relief work, but when a particular occupation, craft or trade became associated with a particular caste, the system evolved a pattern in which co-operation became an important aspect of the economic activities of the community." But now it has been considerably shattered by a weakening of the caste system, introduction of land reforms and programmes of economic development, rise of individualistic system of living and working, the spread of modern democratic ideas and above all by rapid enlargement of economic considerations in the life of the people.

An old system of raising money in South India is known as *chit funds* and *nidhis*, the *bunda* system in *Vidarbha*, the *phad* system in *Kolhapur* and *gonchi* system in *Andhra* are other systems of organised effort at mutual-help and co-operation.¹

Under *chit funds*, a number of people in villages, having mutual knowledge of one another, join together and subscribe for a specific period small sums of money at regular intervals under the guidance of a promoter. When collections are made, lots are drawn and the winning lot gets the total amount collected. The winner subscribes as usual like other members, for the next month but drops out from the draw of the lots. A variant of this system is that, in order to equalise the benefit, the winner gets the amount less a deduction for interest and the amount so deducted is then divided among the other contributors or subscribers who have not won the pool. This is known as the 'discount system.'

The *nidhi* is a type of mutual loan association where every member contributes monthly one rupee or its multiple normally for

1. Cf. "Interdependence or Co-operation is the key note of..... traditional village organisation", C. M. Hugh, *Co-operative movement in India*, 1959, p. 43.

"Different types of indigenous co-operation still survives in Rajput villages. At harvest time, following a custom called *abat*, if a man cannot cut all his crop, he calls in his neighbours and in return for their help regales them in the middle of the day with a feast..... Where there are embankments to protect the crops from spasmodic torrents, they are repaired every year by common effort ; so, too, the village ponds..... Wells too are sunk co-operatively and are run either by each shareholder contributing a bullock to turn the wheel or draw the *charsa* or by each taking in turn to irrigate his fields..... Under the *lana* system of cultivation two or as many as ten peasants join together for a year to cultivate a given area. The produce is divided after each harvest in proportion to their labour and bullock power supplied by each partner. These partnerships are renewed year after year. Watchmen are maintained to protect the crops from monkeys, pigs and straying cattle, from damage and theft : relatives and neighbours help each other at sowing and harvest time, following the *abat* system, called *mangin* Karnal District. Dariing, M. L. *Rusticus Loquitur*, 1930, pp.17, 53, 116.

a period of 84 months. The amount so collected is utilised for granting loans to members, on the basis of their subscription at 6% interest and the balance of un-utilised funds is used for grant of loans and other securities to members and non-members alike.

Under the *phad* system, a group of villagers come together for securing irrigation facilities and also for mutual assistance in agricultural operations. The *phad* leader is either the best cultivator of the locality or a person who is well known to the local commission agent. This practice is known to be over a thousand years old and is still continuing in Kolhapur district.

The *phad* maintains a common fund from which current expenditure is met. The pool is made by equal contribution of members. The members themselves work on the area cultivated by the *phad*. Whenever needed outside labour is employed and it is paid from the pool. Net produce is distributed among the members in proportion to their labour. Usually, lands of members are pooled in the *phad* but sometimes land belonging to non-members is also leased in addition. The leader of the *phad* arranges for finances with commission agents and maintains accounts for which he neither received any extra share in the profit nor any special remuneration. A member can leave the *phad* only after the harvest is over, when he receives his proportionate share in the assets and shares equally the liabilities.

Under the *gonchi* system, a *gonchi* is a contiguous area which is divided into plots convenient for various agricultural operations. The joint cultivation is supervised by a person known as "*gonchi kadu*" of the village. The total produce is pooled and divided among the members, according to the labour put in and bullock power used.

GROWTH OF THE MODERN MOVEMENT

The co-operative movement in India has been a growth of over 75 years and is largely dependent for its origin as well as development on the Government. Even before 1904 (when the movement was first officially set up), the Government was not unaware of the difficulties which the peasants and farmers were facing in borrowing funds and was anxious to ease the situation. As early as 1882 Sir William Wedderburn and Justice Ranade prepared a scheme for establishing the Agricultural Banks to provide loans to farmers. Their scheme was not accepted in the form in which it was presented : but its essential features were embodied in the Land Improvement and Agriculturists Loans Act (XIX of 1883 and XII of 1884 respectively), under which the agriculturists could borrow from the Government for productive purposes at the rate of 6 per cent. per annum. Under the *Land Improvement Loans Act* of 1883, long-term *takavi* loans on the security of mortgage of land were available for the following purposes :—

(a) Construction of wells, tanks and other works of storage, supply or distribution of water for purposes of agriculture, or for the use of men and cattle employed in agriculture ; (b) Preparation of land for agriculture ; (c) Drainage, reclamation from rivers or other waters or protection from floods or from soil erosion or other damages by water of land used for agricultural purpose ; or waste land which is culturable ; (d) Reclamation, clearance, enclosure or permanent improvement of land for agricultural purposes ; (e) Renewal or reconstruction of any of the foregoing works or alteration thereon or addition thereto ; and (f) Such other works which the Government may so declare.

The *Agriculturists' Loans Act* made provision for the short-term credit for the relief of distress and to enable the cultivators to purchase cattle, seeds, implements, etc. The *Gadgil Committee* remarked that "such loans were properly closely connected in their origin and their operation with times of distress or famine," and that the Committee agreed that "the Act should be confined to time of emergency and stress and not be used more extensively in normal circumstances."

It should work cheaply, almost gratuitously and, thus, cheap credit, influence borrowers towards the true use of credit, and watch the utilisation of loans in accordance with the contract, exercise educative influence in matters of thrift, association and self-help, and develop high forms both of individual capacity, of public life and of national character." But this Report was shelved. It was declared that it was unnecessary to take any action on it, as rural credit in the opinion of officials was not an urgent problem.

In the meantime, H. Dupernex had submitted another scheme under the title of "*People's Bank for Northern India*". The Committee appointed by the Government of India to consider these schemes came to the conclusion that the best way of providing loans to farmers was to start co-operative societies on the lines of Reiffeisen societies. The Famine Commission of 1901 strongly recommended that in order to prevent further famines, it was essential that credit should be made available to the farmers to improve agriculture and that Mutual Credit Association should be started. This point was referred to a Committee in Simla, which in 1901 drafted a Bill for the establishment of Co-operative Societies under the Presidentship of Sir Edward Maclagan Law. After much discussion this new Bill took the form of Co-operative Societies Act of 1904.

As the *Maclagan Committee* pointed out, "the cardinal object of the Act was, by the simplicity and elasticity of its provisions, to permit a genuine Indian movement to spring up based on those general principles which must necessarily underlie any organisation claiming to be called co-operative. Experiments were freely allowed

and more particularly for the furtherance of agricultural rather than industrial credit...the intention was to make matters comparatively easy for the illiterate and ignorant agriculturist." The passage of this Act formally inaugurated the co-operative movement in India. This measure was hailed by Henry Wolff as "a turning point in economic and social history" and by Daniel Hamilton as "the way from poverty to plenty."

History of the Movement

The history of the co-operative movement may be studied under the following heads :

1. Early Stage of Development (1904-1912).
2. Period of Hurried Expansion (1912-18).
3. Period of Unplanned Expansion (1918-1929).
4. Period of Consolidation and Reorganisation (1929-1939).
5. Period of Recovery (1939-1948).
6. Period of Planned Development (1951-to date).

1. Early Stage of Development (1904-1912).

The Co-operative Credit Societies Act was passed on 25th March 1904. Its essential features were :

(1) A society could be formed by any ten persons living in the same village or town or belonging to the same class or tribe for the encouragement of thrift and self-help among the members and cooperation among agriculturists, artisans and persons of limited means.

(2) The societies were given a legal personality and were authorised to raise funds and carry on their business in a corporate capacity.

(3) The organisation and control of co-operative credit societies in each province were put under the charge of the Registrar of co-operative credit societies.

(4) The accounts of every society were to be audited by the Registrar or by a member of his staff free of charge.

(5) Cooperative societies were classed as rural and urban. *Rural Societies* were to have four-fifths of their members agriculturists while *Urban Societies* were to have four-fifths of non-agriculturists.

(6) The liability of the members of a rural society was to be unlimited except with special sanction by the local Government. Liability of the urban society members might be either limited or unlimited.

(7) No dividends were to be paid from the profits of a rural society but the profits were to be carried to the reserve fund. In urban societies one-fourth of the profits was to be credited to the Reserve Fund, although when this fund had grown beyond certain limits fixed under the bye-laws, a bonus might be distributed to the members.

(8) Loans could be given only to members on personal or real security, although ornaments might be legally accepted as security.

(9) The interest of any one member in the society's share capital was strictly restricted. No member could hold shares for more than Rs. 1000/-

(10) Societies formed under the Act were exempt from fees payable under the stamp, registration and income-tax. In the words of Sir Denzil Ibbetson the chief object of these societies was "to give encouragement to the individual thrift, and of mutual co-operation among the members, with a view to utilisation of their combined credit, by the aid of their intimate knowledge of one another's needs and capacities and of the pressure of local public opinion." In other words, *the object was to encourage thrift, self-help and co-operation among agriculturists, artisans and persons of limited means.*

Sir Adamson cherished the hope for the future of these societies in these words: "Our co-operative credit society is but a frail barque launched upon a treacherous ocean but if it can escape from being wrecked by the opposition of the moneylender, if it can avoid being stranded on the shoals of mutual distrust among its members it can carry safe to the port a portion of its cargo of self-help and co-operation. It will some day rank as the most important bill ever passed by the Government for the betterment of the Indian agriculturists.

The Maclagan Committee said, "the movement did not take long to outgrow the dreams of its founders." It made significant progress during the initial years. The number of societies and members increased from 843 and 90,844 in 1906-7 to 8177 and 403,318 respectively in 1911-12. During this period, the amount of working capital increased from Rs. 23.72 lakhs to Rs. 335.74 lakhs.

The following table gives an idea of the growth of the credit societies in India as a result of the Act of 1904 up to 1912:

Progress of Co-operative Movement from 1906-7 to 1911-12

Year	No. of societies	No. of members	Amount of working capital in Rs.
1906-7	843	90844	2371683
1907-8	1357	149160	4414086
1908-9	1957	180338	8232225
1909-10	3428	224797	12468312
1910-11	5321	305058	20305800
1911-12	8177	403318	33574162

2. Period of Hurried Expansion (1912-1918)

The Act of 1904 provided for the registration of the primary credit societies only. It was found insufficient to meet the growing needs of the market because : (i) It made no provision for purposes other than credit, i. e., for the establishment of central agencies such as Central Banks or Unions, necessary for the proper financing of primary credit societies. (ii) The classification of societies into rural and urban was found to be extremely unscientific and inconvenient. (iii) The total prohibition of distribution of profits (as in Madras and the Punjab) in rural societies with unlimited liability was found to cause some hardship to rural members.

The Government realised these deficiencies and passed a comprehensive Co-operative Societies Act in 1912. The distinctive features of the Act were :

(1) Any society may be registered "which has for its objects the promotion of economic interests of its members in accordance with co-operative principles, or a society established with the 'object of facilitating the operation of such society."

(2) Unless otherwise directed by the local Government : (a) the liability of the co-operative societies shall be limited, (b) the liability of the rural societies shall be unlimited.

(3) The requirements of an annual credit is retained as are numerous other provisions of the Act of 1904.

(4) Any registered society may with the Registrar's sanction, after carrying 1/4 of the annual net profits to a reserve fund, the society can contribute upto 10 per cent of the remaining net profits to a wide range charitable purposes.

(5) A society has a charge upon the shares, deposits, etc. of a member with the society in respect of any debt due from such a member.

(6) The societies are granted exemption from compulsory registration and the State Government may grant exemption from the payment of income-tax, stamp duties and registration fees.

(7) "Co-operation" may not be used as part of the title of any business concern not registered under the Act, unless it was already doing business under this name before the Act came into effect.

(8) Shares or interest in co-operative societies are exempt from attachment.

(9) The society has a prior claim to enforce the recovery of dues against a member like milk, manure and yarn.

(10) Local Governments were given considerable discretion in connection with the making of rules for the working of societies under the Act, including conditions of membership, methods of operation, procedure at general meetings and provisions for arbitration between members and the committee or officers of the society, such rules to have the same force in the respective provinces as the Act itself.

The defects of the Act of 1904 were remedied by this new Act, which gave a great stimulus to the co-operative movement. It legalised many co-operative societies which had hitherto no legal recognition. Societies were now classified as limited and unlimited.

After 1912, there was a rapid growth not only in the number of co-operative credit societies but also in non-agricultural credit societies and in their membership. However, the development was not uniform in all provinces. It was more rapid in Bombay, Madras and Punjab (where the cultivator had mortgage rights in their lands) than in the zamindari areas like Bengal (whose cultivators had little to offer except their personal security). A large number of non-credit societies for supply of milk, sale of produce, cattle insurance, and manure and for retailing farm implements and common necessities were developed. By 1917-18 the number of societies shot up to 25,192, and the number of members increased to 10.9 lakhs and working capital to Rs.760.1 lakhs. The number of central institutions was also growing rapidly. In 1914, when the Government of India appointed a Committee under Sir Edward Maclagan to "examine whether the movement especially in its higher stages and financial aspects was progressing on sound lines and to suggest measures for improvement which seemed to be required." The Report appeared in 1915. The Committee sounded a note of warning on the hurried expansion of the movement and made many recommendations that utmost care was to be exercised in the formation of a co-operative society with a view to make it truly co-operative. These were : (1) Knowledge of co-operative principles and proper selection of members, (2) Honesty is the chief basis of credit. (3) Dealings to take place with members only. (4) Loans were not to be granted for

speculative purposes, (5) Exercise of careful scrutiny before advancing loans and proper vigilance afterwards. (6) Ultimate authority to be in the hands of members and not in those of office-bearers. (7) Encouragement of thrift and the constitution of an adequate reserve fund. (8) Only one vote for one member and maximum publicity within the society. (9) Capital to be raised as far as possible from savings among the members and neighbours, and (10) Punctual repayment of loans.

The Committee found a number of glaring defects in the working of the movement, such as : (i) illiteracy and ignorance of the members about management and supervision of the societies ; (ii) negligence of duty and mismanagement of funds and acts of fraud (like taking bulk of loans by means of *benami* loans) on the part of the management ; (iii) non-punctuality in repayment of loans and grant of loans to near relations and friends of the member of committee or management ; (iv) misuse of loans by the members ; (v) deserving and poor were excluded from the societies ; (vi) societies were not properly audited and inspected ; and (vii) much delay occurred in granting loans to the needy cultivators which drove them to the moneylenders. (viii) banks were regarded as the "*Sarkars Bank*" from which loans were taken with the intention of keeping the amount.

The Committee very wisely warned against the starting of new societies by remarking that the pace of movement should not be unduly quickened from outside. It emphasised that the urge towards co-operation should be spontaneous as far as possible and pointed to the necessity of guarding against the dangers of granting credit too easily. It further emphasised the need for thorough audit and supervision in order to prevent bad management and embezzlement and to inspire confidence in the investing public. It made many proposals which remained the basis of future development for a number of years. Some of them are : (1) The structural picture as recommended by the committee was to consist of precisely defined classes of societies—*primary*, meant for individuals ; *unions*, that is federation of societies for purposes of supervision and *Central Banks* at the district level doing banking business, and *provincial banks* at the provincial level to serve as apex banks.

The Committee, therefore, made important recommendations, such as : (i) the area of operation of the primary society should be restricted to a village ; (ii) the size of the society should not be large ; (iii) the society should have unlimited liability ; (iv) emphasis should be laid on the deposits ; (v) repayment of loans should be strictly enforced according to the instalments fixed ; (vi) non-credit societies should be encouraged, though central banks may finance them ; (vii) societies should be properly audited and regularly supervised for "without them a good society may soon degenerate and a bad society may soon come to reign." (viii) unions should serve

the purpose of supervision and assessment of credit of individual societies and they should form a link between primary societies and central banks ; (ix) all co-operative societies should build up a reserve fund ; and (x) greater control should be exercised by the Government over the finances of the co-operatives.

Alas, "These very sound and valuable recommendations were dishonoured often in neglect than in their execution." The period between 1904 and the publication of the MacLagan Committee Report in 1915 has been regarded as "*the period of initial effort and planning.*"²

3. The Period of Unplanned Expansion (1919-29)

On the passing of the Government of India Act of 1919, co-operation became a provincial subject and was administered by provincial Governments. Some Governments passed their own Acts to undertake mansided developments. Bombay gave the lead by passing the Cooperative Societies Act of 1925. This was followed by Madras in 1932 and Bihar and Orissa in 1935, Coorg in 1937 and Bengal in 1941. Other States adopted the Central Act of 1912.

The Act of 1919 gave great stimulus to the movement. Its success was measured more by its quantity than by its quality. The number and membership of agricultural credit societies increased three times while their working capital increased four times between 1918-19 to 1928-29. The number of non-credit societies increased five fold, and the membership by four and half times. The working capital of credit and non-credit societies increased by four times and six times respectively. But with this expansion, overdues were steadily increasing. These led to the institution by various provinces of Co-operative Committees of Enquiry to enquire into the working of the movement. The Central Provinces led the way with such an enquiry in 1922, and Bihar and Orissa in 1923. The Okden Committee in U. P., the Towusend Committee in Madras, the Calvert Committee in Burma made similar enquiries. The rapid growth of movement between 1919 and 1930 is characterised by Mr. Ramdas Pantulu as the period of "*unplanned expansion*".³

During this period co-operation received sufficient encouragement under the popular ministries. This will be clear from the following table :

-
1. Qureshi, A., *Future of Co-operative Movement in India*, 1939.
 2. Pantulu, R., *Yearbook and Directory of Indian Co-operation*, Madras, 1940, p. 1
 3. Pantulu, R., *Ibid*, p. 1

Progress of Co-operative Movement from 1914-15 to 1929-30.

Year	No. of societies	No of members	Working capital (Rs 000)
1914-15	17327	824469	122292
1915-17	23336	108425	311225
1921-22	52182	1974290	311225
1923-24	61106	2313567	405297
1925-26	80182	3058625	576039
1927-28	96091	3070173	767087
1929-30	104187	4181904	895178

"The great depression gave a tremendous set-back to cooperative activity. Not only did it stall the progress of the movement, but created grave difficulties for the existing institutions. The catastrophic fall in the prices of agricultural goods and of land threatened the very existence of some societies and violently disturbed the economic stability of others. Recovery of loans became extremely difficult. There were very heavy accumulations of overdues and freezing of society's assets. Normal working of these bodies was in many cases almost completely paralysed and in several others most adversely affected. There was a serious contraction of cooperative credit.¹ The *Royal Commission on Agriculture* (1927) and the *Central and Provincial Banking Enquiry Committees* (1929) indirectly made recommendations for their improvement. The Royal Commission stated that "the main cause of failure of the cooperative movement was the lack of site education and of adequate supervision and guidance." It further remarked that, "If Cooperation fails there will fail the best hopes of rural India."² The movement came to grief first in Burma and then suffered seriously in prestige in Bihar, Bengal and many other provinces. Since then efforts were directed more to the rehabilitation, reconstruction and reorganisation of existing societies than to further rapid expansion. The co-operative movement in India was passing through the phase of rectification and consolidation, cautious expansion and experiment.³

During this period the chief aim of the cooperative departments was to rectify and rehabilitate the societies rather than to expand them. Attention was paid to the consolidation of the existing societies by developing their resources and making them more cooperative. Registration of lifeless and dead societies was cancelled. Because of these measures, the number of societies showed a declining trend, recording a fall of about 13 percent between 1930-31 to 1933-34. Secondly, a close supervision and strict scrutiny of the

1. Ministry of Co-operation, *Sahakari Samaj*, p. 16
2. *Report of the Royal Commission on Agriculture*, p. 450.
3. R B I *Review of the Co-operative Movement in India*, 1941, p. 4.

percentage of overdues of loans outstanding fell from 47 to 43 per cent during the same period.

The depression in early thirties of this century and the collapse of the movement in some provinces as a result of it, led to the appointment of special Experts and Enquiry Committees in different provinces to examine the position of the co-operative movement and the fundamentals of co-operative structure with a view to reconstruction and in some cases permanent reorganisation. Mention may be made of the Raghavacharya Committee in Madras (1940), Devdhar Enquiry Committee on Cooperation in Travancore (1935); K. S. Iyer Committee in Mysore (1935); Kala Committee in Gwalior (1937), Mehta and Bhansali Committee in Bombay (1937), Deivasikhamani Committee in Orissa (1938), Wace Committee in Punjab (1939), and Ramdas Pantulu Committee for Cooperative Rehabilitation in 1939.

Progress of Co-operative Movement from 1931-35 to 1944-45

Year	No. of societies (000)	Membership (in lakhs)	Working capital (in crores of Rs.)
1931-35	106	43.22	94.61
1938-39	122	53.7	106.47
1939-40	137	60.8	107.10
1940-41	143	64.0	109.32
1941-42	145	67.4	112.42
1942-43	146	69.1	121.04
1943-44	156	76.9	132.21
1944-45	160	83.6	146.63
1945-46	172	91.6	164.00

(4) Period of Recovery (1939-1946)

The abnormal conditions created by World War II led to some far-reaching development in the co-operative movement. Between 1938-39 and 1945-46 the increase in the number of societies, the number of members and the working capital have been respectively 41 per cent, 70 per cent and 54 per cent. Also the movement touched 6 per cent of the population and a society touched 5.4% villages in 1938-39 but 10 per cent population and a society touched 3.8% villages in 1945-46¹. The war stimulated the growth of consumer stores and marketing societies. Many new types of producers' societies like weavers' societies, milk supply unions, motor transport societies, fruit growers' and cane growers' associations, etc. were formed during the war period. Loan repayments were accelerated turnover was brisk and working capital registered a substantial increase. "The war period broadened the functional range of the co-operative movement and it brought about a shift in the lop-sided

1, *Review of the Co-operative Movement in India, 1939-46*, p. 2.

emphasis from credit aspect to the productive and distributive functions or to its multipurpose potentialities, a long felt need for imparting that richness and balance which is necessary for the proper development of the movement.”¹

From the above analysis the following characteristic features may be noted :

Firstly, the co-operative movement in India did not spring up from the people. It was initiated by Government resolution with a view to solve the problem of rural indebtedness. In the words of Mr. V.L. Mehta, “Government are so out of touch with public feeling and sentiment that despite their control of the machinery of administration they fail in their effort to seek an expansion of the movement.” In fact it was not a spontaneous growth but a Government policy.² The distinction between co-operation imposed by the Government and necessarily supervised, regulated, restricted and controlled on the one hand, and co-operation promoted by voluntary initiative and sustained by the cooperative spirit, which ensures the loyalty of the members, on the other hand cannot be over-emphasised.³

Secondly, started originally to provide the farmer with cheap credit it continued to be a predominantly credit movement so that the progress of non-credit co-operation was slow and agricultural credit societies dominated the picture.

Thirdly, though there were inter-provincial differences, the structure of the co-operative organisation was uniform in almost all the provinces e. g., in each province at the head of the movement there were three authorities, viz. the Registrar of the co-operative societies in charge of control and direction of the movement, Provincial or Apex Bank in charge of finance, and the Provincial Co-operative Institute or Union in charge of education and propaganda.

The Reserve Bank of India Review, 1939-40, noted : “Apart from this general expansion, the working of the movement in recent years has been characterised by greater diversity of functions co-operation has permeated several walks of life, some of which were perhaps no more than touched before. It has played an important part in the attempts to solve two big problems, viz. the rehabilitation of displaced persons and the augmentation of the food production. The rehabilitation of displaced persons through the formation of co-operatives received a great fillip, owing mainly to the aid extended by the Government, in the shape of loans, grants in-aid, cheap building materials and similar other concessions. Housing, industrial

1. R B I Report of the Co-operative Movement in India, 1939-46. p.1.

2. Horace Plunket Foundation, *Year Book of Agricultural-Co-operation* 1930 p. 20.

3. *Ibid.*, 1931, p. 24

and forming societies were generally encouraged so that the displaced persons could be settled in colonies and provided with gainful occupations. In the field of food production co-operatives were entrusted with the distribution of manures, chemical fertilisers and agricultural implements. Credit facilities were liberalised for the members of co-operative credit societies by such measures as the relaxation of credit limits, financing at concessional rates, installations of pumping sets and oil engines. Thus by the introduction of modern methods there was sought to be brought about both more intensive and extensive cultivation of land."

All India Progress of the Co-operative Movement since 1906-7

Period covered	No. of societies of all types		No. of primary society members		Working capital	
	Central	Pri- mary	Agricul- tural	Non- Agricul- tural	Total (Rs. 1000)	Percentage of work- ing capital- owned
Average for 4 years from 1906-7 to 1909-10	17	1909	107643	54267	6812	21.8
Average for 5 years from 1910-11 to 1911-15	231	11555	459096	89157	54142	20.8
Average for 5 years from 1914-15 to 1919-20	942	27535	902930	266031	151847	24.7
Average for 5 years from 1920-21 to 1924-25	1808	45899	1661098	493509	363626	23.0
Average for 5 years from 1925-26 to 1929-30	1981	91955	2791562	897279	748913	22.8
Average for 5 years from 1930-31 to 1934-35	1612	104102	3063628	1258641	946106	27.2
Average for 5 years from 1935-36 to 1939-40	1129	115831	3437873	1638869	1046773	29.7
Average for 5 years from 1940-41 to 1944-45	1053	148835	4768173	2449632	1243474	29.9
1945-46	1064	1711056	42671	2520673	1640009	29.0

Fourthly, full-scale development of the multi-purpose idea in several States like Tamil Nadu, Maharashtra, Karnataka, U. P., was another notable trend in the primary credit structure. These socie-

ties were entrusted with the distribution of rationed and other essential commodities.

An important development during this period was the appointment of the *Co-operative Planning Committee* in 1945 which recommended that "primary societies should be converted into multipurpose societies and that efforts should be made to bring 30 per cent of the rural population and 50 per cent of the villages within the ambit of reorganised societies within a period of 10 years. It also urged that the Reserve Bank should provide greater assistance to co-operatives." An indication of the new role of the co-operative movement was given by the *Agricultural Finance Sub-Committee* (under the Chairmanship of Dr. D. R. Gadgil) which observed that "the spread of co-operation would provide the best and the more lasting solution for most problems of rural economy in general and for the problems of agricultural credit in particular." It, however, considered that it might not be possible for the co-operative movement to supply the entire credit needs of agriculturists. It recommended, therefore, that State aid should be given in much larger a measure than had been done in the past so that the co-operatives might be enabled to supply better credit facilities.

The *Co-operative Planning Committee* suggested that (i) the supply of credit touched only one aspect of the life of a cultivator, the activities of the primary societies should be so extended as to cover the whole of his life because "the main causes of the limited progress of the movement was the fact that it did not, especially in its initial stages, take the life of the individual as a whole," (ii) That primary credit societies should be so reformed and reorganised as to serve as centres for the general economic development of their members ; (iii) That an attempt should be made to bring 50 per cent of the villages and 30 per cent of the rural population within the ambit of the reorganised primary societies within a period of 10 years, and (iv) that 25 per cent of the total marketable surplus of agricultural produce of the country should come under co-operation.²

Many of these recommendations were accepted by the 15th Conference of Registrars of Co-operative Societies. It was at this Conference that it was realised for the first time that there should be effective linking of credit with marketing ; assistance for construction of godowns—rat and damp proof - and setting up processing plants by grant of liberal loans and subsidies. The necessity for training of expert staff was also stressed.

Fifthly, though the movement was officially sponsored, its further development took place without much financial aid. The

-
1. *Report of the Agricultural Finance Sub-Committee*, 1945, p. 47,
 2. *Report of the Co-operative Planning Committee*, 1946, pp. 218 & 227.

amount given by way of grants-in-aid or subsidies was rather insignificant.

Finally, the movement had a haphazard growth, with hardly any co-ordination between the various branches such as the credit and marketing or between consumers and marketing societies.

The movement, on the whole, did not make substantial progress because of the *laissez faire* policy of the State and the general lack of co-operative principles, inefficient management, high overdues, unlimited liability of societies, lack of education and training among the members, severe opposition from the moneylenders and unsympathetic attitude and even ridicule of the revenue staff. In this connection, the remarks of the *Rural Credit Survey Committee* are noteworthy "the Co-operative form of organisation has to face not merely the competition but also in large degree to the positive opposition of a powerful array of non-co-operative private individuals and institutions."¹

The *Rural Banking Enquiry Committee* (1949-50) while making some useful recommendations regarding agricultural credit generally suggested the formation of rural Co-operative banks and expanding urban banks, Central banks and provincial banks to serve the needs of the rural areas.

The Period of Planned Development (1951 to date)

The major development in the co-operative field since Independence was the appointment of a *Committee of Direction* (known as the Rural Credit Survey Committee) in 1951 by the Reserve Bank of India, which submitted its report in 1954. It pointed out : (i) the co-operatives supplied only 3.5 per cent of total borrowings of the cultivators while the major share was provided by the rural moneylenders. (ii) Even this little co-operative credit reached only the wealthier members of the village who owned credit worthy securities, and needs of the poor farmers were not satisfied, (iii) Large parts of the country were not covered by the co-operatives. After analysing the various causes for unsatisfactory working of the movement, the Committee concluded that "*Co-operation has failed but co-operation must succeed.*" The reasons for the co-operative failure of the co-operative credit structure were functional, structural and administrative defects, dearth of suitable personnel to conduct the affairs of the societies, lack of training with a background of mass illiteracy, the grave and chronic deficiency in village communications, storage and other vital economic requirements. Other causes were related to certain fundamental weaknesses which had developed in the structure. In the opinion of the Committee, "the problem is not one of reorganisation of Co-operative credit as of the creation of new conditions in which it can operate effectively and for the benefit of the weak."

1. *All-India Rural Survey Committee Report*, Vol. II, 1954,

The Committee recommended an *Integrated Scheme of Rural Credit* involving three fundamental principles, namely, (i) State participation at different levels ; (ii) co-ordination of credit with other economic activities specially processing and marketing ; and (iii) administration through trained and efficient personnel responsible to the needs of rural population. In other words, this meant the encouragement of state partnership in (i) co-operative credit, (ii) co-operative economic activity, (iii) storage and warehousing, and (iv) commercial banking.

The Committee's other recommendations are summarised below :

(1) The economic viability of the co-operatives, at the village level was essential. Existing village societies should be revitalised and reorganised and made really effective.

(2) Loans (particularly short-term loans) should be given on the basis of the anticipated crops and not on the security of land and tangible assets. A "Crop loan system" should be evolved.

(3) Producers should market their produce through co-operative marketing organisations so that they could secure best possible prices. Members borrowing from the co-operative institutions were required to market their produce cooperatively.

(4) Storage and warehousing facilities should be provided through the state partnership organisation.

(5) A Co-operative Development and Warehousing Board should be constituted on an all-India level.

(6) A National Stabilization Fund should be constituted in the Reserve Bank of India. Similar stabilization funds should be created at the apex and central bank levels throughout the country for converting short term into medium-term loans when full repayment of short-term loans was not possible because of natural calamities.

(7) A Long-term Operations Fund should be constituted in the Reserve Bank of India, from loans given to the State Government for participating in the share capital of co-operative credit institutions ; for giving medium-term loans ; for purchasing debentures of land mortgage banks and for giving long-term loans.

(8) The Imperial Bank of India should be nationalised and should increasingly undertake the financing of co-operative marketing and processing societies, wherever existing co-operative banks are unable to do so.

(9) A Central Committee for co-operative training and education at the all-India regional and state levels should be set up to supervise training systems,

The whole scheme was based on the view that co-operative organisation has little chance of success unless it tackled the problem on a comprehensive scale as an integrated whole. This necessarily implied that the co-operative structure must bring about an increase in co-operative credit for production along with co-operative marketing. These recommendations were generally approved and were made the basis for future plans for development

Co-operation During the First Plan

In the *First Five Year Plan* Co-operation was recognised as and "instrument of planned economic action in democracy." The co-operative agency was recognised as better suited than the state for ensuring proper utilisation of credit for productive purposes. Taccavi loans for developmental purposes were to be distributed through the co-operatives. The Plan set targets for the provision of co-operative credit thus : *Short-term loans*—Rs. 100 crores ; *Medium term loans*—Rs. 25 crores and *long term loans*—Rs. 5 crores. The Plan emphasized for (i) the development of co-operative farming, the co-operative marketing and processing of raw materials in the rural areas ; (ii) having adequately trained staff ; and (iii) bringing 50 per cent of India's villages and 30 per cent of the rural population under the co-operative fold. The actual outlay during the Plan period was Rs. 5.15 crores as against a provision of Rs. 6.16 crores.

Evaluation. The number of primary agricultural credit societies increased from 1.15 lakhs to 1.59 lakhs ; membership increased from 51.54 lakhs to 77.91 lakhs ; loans issued from 22.90 crores of rupees to 50.16 crores but the percentage of over due to loan outstanding increased from 21.9 to 25.0. The percentage of rural population served increased from 10 to 16. The amount of loan issued more than doubled while the number and membership of societies showed an increase of 39 per cent and 51 per cent respectively ; and the percentage of overdues increased to 25. Some progress in the field of co-operative marketing and processing was made in a few states like Maharashtra and Tamil Nadu but its total effect on the economy was not very impressive. A Committee for Cooperative Training was set up for imparting training facilities for senior intermediate and junior staff of the co-operative institutions.

Co-operation did not make much contribution towards the fulfilment of the broad objectives of the First Plan. This was due to a number of factors¹

- (i) Internal weaknesses of co-operative structure such as small membership, weak capital structure, inadequate loan operations, heavy over-dues, failure to harness local savings and to promote thrift.

1. Ministry of Community Development, *Sahakari Samaj*, 1962, pp. 48-5

- (ii) It took quite some time for the co-operatives to appreciate the precise role assigned to them in the development of the economy and gear up their activities accordingly.
- (iii) The policy of the states towards co-operation was not sufficiently defined and action to implement it was largely left to the States and co-operative movement itself.
- (iv) The schemes of co-operative development of various States were not uniform in their objects and methods and differed widely from state to state.
- (v) There was no agreed policy for the country as a whole, nor were any definite targets set except in regard to the volume of advances to cultivators through institutional agencies.
- (vi) The co-operative movement was not sufficiently broad-based and arrangements for credit were not linked generally with programmes for increasing agricultural production and with schemes of co-operative marketing of agricultural produce.

Consequently, there was a marked unevenness in the development of the co-operative structure in different States.

Progress of Co-operative Movement during 1950-51 to 1955-56

	1950-51	1955-56
1. No. of primary agricultural credit societies	115.462	159.936
2. Membership (Lakhs)	51.54	77.91
3. Average membership per family	45	49
4. Percentage of rural pop. served	10.3	15.6
5. Loans issued (Rs. crores)	22.90	50.16
6. Average Loan per member (Rs.)	45	64
7. Average share capital per society (Rs.)	727	1051
8. Av. working capital (Rs.)	3,546	4946
9. Av. Deposits per society (Rs.)	391	441
10. Percentage of overdues to outstandings.	21.0	25.0

Co-operation During the Second Plan

The *Second Five Year Plan* was drawn up more or less, on the basis of accepted recommendations of the All-India Rural Credit Survey Committee particularly in respect of credit, marketing and processing.

Following targets were laid down :

	1955-56	1960-61
Membership of primary agricultural credit society	5 million	15 m
Short-term credit	Rs. 30 crores	Rs. 159 cr.
Medium term credit	Rs. 10 cr.	Rs. 50 cr.
Long-term Loans	Rs. 3 cr.	Rs. 25 cr.
Average loan per member	Rs. 60	Rs. 100
Marketing of agricultural produce through co-operatives	10% marketable surplus	

The Plan set a target for co-operative credit thus : short-term Rs. 159 crores ; medium-term Rs. 50 crores, and long-term Rs. 25 crores. Ten percent of the marketable surplus of agricultural produce was to be marketed through co-operatives. Co-operative processing of sugarcane and cotton was to be encouraged. Rural godowns and godowns for marketing societies had to be set up for storage of produce. Multipurpose societies were to be encouraged and training facilities were to be increased to the members of the cooperatives.

A sum of Rs. 52 crores was earmarked in the plan for the implementation of the above schemes. Besides, the Reserve Bank of India was also to provide Rs. 25 crores to strengthen the capital structure of cooperatives. The actual outlay was of the order of Rs. 39 crores and Rs. 20 crores respectively.

The role of co-operatives as enunciated in the Second Five Year Plan was :

- (1) Economic development on democratic lines offers a vast field for the application of co-operation in its infinitely varied forms. The building up of co-operative sector is, therefore, one of the central aims of national policy. Co-operatives have to play an important part in respect of agricultural production, marketing, cottage and processing industries and internal trade.
- (2) A village co-operative should be large enough to be an efficient unit but not so large as would make it difficult to secure mutual knowledge.
- (3) Co-operative marketing, storage and processing should be developed on a large scale.
- (4) Village societies should form federations of their own at different levels as necessary. Their functions should be

multi-purpose and should cover credit, thrift, supplies of agricultural production, consumer requirements and marketing.

- (5) A comprehensive and country-wide programme of training and education of the people, and employees of co-operative institutions was necessary for the success of the programme.
- (6) Co-operatives and panchayats should be organised in all the villages and there must be the closest collaboration between them and the community development agency.
- (7) Encouragement of co-operative farming by pilot projects, settlement of surplus land on co-operative lines and by giving financial and other assistance to existing farming societies.
- (8) Strengthening of department staff to cope with the large volume of work and the larger responsibility involved.
- (9) The programme of reorganisation of rural credit and marketing should be carried out in close co-operation between the co-operative and agricultural departments.

Evaluation (i) Under the provisions of the Agricultural Produce Development of Warehousing Corporation Act, 1956, the National Co-operative Development and Warehousing Board was established with effect from 1st September, 1956. This Board was entrusted with the functions of planning and promoting programmes of production, marketing, storage, warehousing, export and import of agricultural produce through a co-operative society or a warehousing co-operation and providing financial assistance to the State Governments and Central and State Warehousing Corporation for the purpose. The Central Warehousing Corporation was established on March 2, 1957, with a paid up share capital of Rs. 237.79 lakhs of which 40 per cent was held by the N. C. D. and W. Board. It was able to set up 40 warehouses and providing storage facilities for 79,020 tons. State Warehousing Corporations were set up in all states and they set up 266 warehouses.

(ii) The State Bank of India was brought into existence on July 1, 1955. It opened 438 branches by June, 1961, as against a target of 400 branches within 5 years.

(iii) The Reserve Bank of India Act was amended with a view to improve the facilities for rural credit in the context of the Integrated Scheme of Rural Credit. Under the amended Act, the Reserve Bank constituted a *National Agricultural Credit (Long term operations) Fund* with an initial contribution of Rs. 10 crores. This was later augmented by a further contribution of 50 crores. Funds amounting to Rs. 23.66 crores were sanctioned out of which Rs. 20.86

crores were availed by 15 State Governments for investment in the share capital of co-operative credit societies. Another Fund established under the R. B. I. was the *National Agricultural Credit (Stabilisation) Fund* with an initial contribution of Rs. 1 crore. The purpose of this Fund was to enable the short-term credit to be converted into medium term loans which could not be repaid due to unavoidable factors like droughts, floods etc. No occasion arose for drawing upon this fund. Existing small societies were strengthened and many new ones opened. Opening of large-sized societies were given up.

(iv) Co-operative societies of all types increased from 2.40 lakhs to 3.13 lakhs ; their working capital from Rs. 4688 million to Rs. 10,835 million and loan advanced by primary societies from Rs. 1,208 million to Rs. 3,233 million. The number of primary societies rose from 1.60 lakhs to 2.13 lakhs ; their membership from 7.79 million to about 17.5 million and the coverage of these societies was 24 per cent at the end of 1960-61. The short and medium term credit advanced by them was of the order of Rs. 2,050 million as against Rs. 496 million during 1955-56 and the working capital increased from Rs. 791 million to Rs. 2,239 million.

The number of Central Banks was reduced from 478 to 400 as a result of process of amalgamation and re-organisation of central banks with the aim of having one strong central bank for a district. But their paid up share capital and deposits increased from Rs. 85 and Rs. 557 million to Rs. 315 and Rs. 954 million and the percentage of over-dues fell from 14.5 to 13.7.

The number of State Banks increased to 22. The deposits held by them had increased from Rs. 367 millions to Rs. 602 millions and they advanced loans of Rs. 1969 million in 1960-61 as against only Rs. 679 million in 1955-56 and the overdues reduced from 10.6 to 5 per cent.

The number of Primary Land Mortgage banks rose from 302 to 408. During this period their membership rose from 314 thousand to 550 thousand and paid-up share capital from Rs. 8.6 million to Rs. 15.5 million and their advanced loans aggregating to Rs. 51 million as against Rs. 17 millions in 1955-56. The share capital also increased from Rs. 114 million to Rs. 204 millions.

(v) About 18,000 primary marketing societies were set up. Assistance was granted to co-operatives for reconstruction of 4,100 rural godowns and 1,668 mandi level godowns. The number of co-operative sugar factories increased from 3 to 30,390 processing units were organised. Thus, significant progress was made in all directions during the Second Plan period, as would be clear from the table given below.

Progress of Co-operative Movement from 1955-56 to 1960-61

	1955-56	1960-61
1. No. of Societies (Lakhs)	2.40	3.32
2. Membership of primary Societies (Lakhs)	176	342
3. Share capital (Rs. crores)	77	221
4. Working capital (Rs. crores)	469	1,312
5. Loans Advanced by Pr. Societies (Rs. crores)	50	203
6. Percentage of villages covered		75
7. % of Rural Pop. covered by primary credit societies	12	24
8. Average Loan Advanced per member (Rs.)	64	119
9. Av. membership per society	49	80
10. Av. paid-up capital per society (Rs.)	1051	2722
11. Av. Deposits per society (Rs.)	441	688
12. Av. working Capital per Society (Rs.)	4946	12,913

National Development Council Resolution

The N. D. C. Resolution of November, 1959 emphasised the basic objective of co-operative policy as one of rebuilding the rural economy and in particular increasing agricultural production. The Council called for organisation of co-operatives on the basis of village community, their effective functioning as service co-operative, universal membership and provision of adequate credit in relation to production plans, expansion of the programme of marketing, storage and processing and of training facilities and simplification of laws and procedures.

Some of the important recommendations of the Council were :

- (1) Co-operatives were to be formed on the basis of a society as a primary unit but where villages were very small, more than one village should be grouped to form a society for a population of about 1,000.
- (2) The development of the co-operative movement should be directed towards intensifying agricultural production, mobilising local man-power and resources and in general term, rebuilding the rural economy.
- (3) The co-operatives and panchayats should serve identical areas.
- (4) Special attention must be given to facilities for the grant of crop loans.
- (5) The restrictive features of the existing co-operative legislation should be removed.
- (6) The village co-operatives should be converted into Service Co-operatives taking up in addition to credit, various

functions such as supplies of agricultural production requisites, marketing, etc.

- (7) Marketing should be taken up on a large scale and the existing marketing societies should be strengthened. Co-operative marketing should be linked with credit and arrangements should be made to collect the surplus agricultural produce from farmers through village co-operatives and marketing societies at assured prices. The programme of co-operative processing should be enlarged.
- (8) There should be closest possible association with the representatives of non-official co-operative organisations.
- (9) *Takkavi* loans and other facilities should be made available to the farmers through co-operatives, and thus conditions should be created in which every peasant and rural worker would find it to his advantage to join the village co-operatives.
- (10) The membership of co-operatives should be increased from 10 millions to 20 millions.

Working Group on Cooperation

In November, 1958, a Working Group was set up by the Government to consider the administrative and organisational arrangements required for implementing the resolutions of the N.D.C. The Group observed :

“Until the co-operative structure at each level is strengthened the provision of credit on an adequate scale through the co-operatives does not seem feasible.....Suitable arrangements must be made for credit. *Firstly*, any substantial increase in membership unaccompanied by the provision of adequate and timely credit will discourage new members from joining the co-operative societies and will adversely affect the growth of the movement. *Secondly*, increased agricultural production in the immediate future will not be possible without much larger credit being made available. It is of the utmost importance that adequate credit for improved seeds, fertilisers, and manures should be readily available and in time to every cultivator who needs it”

For achieving the objectives of the N. D. C. Resolution, the Group put two patterns—one for general adoption and the other for adoption in special circumstances. Under the *first pattern* primary credit societies were to be organised with coverage as suggested by the N. D. C. Under the *second pattern*, also, societies would be organised for each village but would perform all functions other than credit which would be undertaken by a credit union covering a compact group of villages within a radius of three miles from headquarters and with a population of about 4,000 to 5,000.

Other important recommendations of the Group were :

(i) Functions of the village panchayats and the village co-operatives should be clearly demarcated and there should be the fullest co-ordination between the two.

(ii) Supervising Unions should be entrusted with the supervision of activities connected with the co-operative societies in the area, normally covering a block such as promotional work, education of members, rectification of defects disclosed in audit, ensuring proper and timely disbursements and recovery of loans and generally activating the societies in various ways."

(iii) The policy of Government nomination of the official as chairman of the Board should be given up. Necessary atmosphere should be created to attract honorary workers and leaders with enthusiasm, ability and integration in much larger numbers.

(iv) The State Governments should examine the functions of co-operative societies, specially relating to administrative and procedural processes, and take necessary steps to simplify the administrative processes and ensure the popular character of the movement.

(v) The rate of interest at which takkavi loans were made available was generally lower than that charged by co-operatives. If all credit to the cultivators were given through one agency, a uniform rate should be worked out and an element of subsidy should be evolved.

(vi) For the success of the movement the work of distribution of fertilisers, seeds, etc., should be handled by co-operative societies only.

Policy Letter of May, 1959

The above recommendations were considered by the Central Government and the N. D. C. Certain decisions were taken on the basis of which the State Governments were sent the letter indicating the broad outlines of the policy to be followed by them in respect of co-operative development during the remaining period of the Second Plan and thereafter.

The salient features of the Policy were : (i) organisation of the co-operatives on the basis of the village community as the primary unit ; (ii) co-operative societies should work as multipurpose societies ; (iii) organisation of the new and revitalising and reorganising of the existing societies should be taken up immediately ; (iv) a village co-operative and a panchayat should be coterminous to their jurisdiction ; (v) loans should be given on the basis of the purpose for which the loan was required and not on the credit worthiness of the borrower on the basis of the property he possessed ; (vi) membership should be made universal ; (vii) programme of co-operative marketing storage and processing should be accelerated and expanded ; (viii) the staff of co-operative department should be

strengthened and adequate arrangement made for their training ; (ix) the movement must increasingly be in the hands of non officials ; (x) takkavi loans should be channelled through co-operatives.

Mysore Conference of State Ministers of Co-operation, 1959

The co-operative policy laid down by the N. D. C. and the Central Government was discussed at the Third Conference at Mysore and was generally accepted. The Conference recommended that :

(a) The question of providing adequate finance and of State partnership in the share capital at the primary level should be referred to an Expert Committee ; (b) The existing arrangements for supervision which varied from State to State should not be disturbed without a careful examination ; (c) The co-operative societies must recognise their obligations towards the economically weaker sections in the village.

In order to minimise risks arising from extension of credit to weaker sections in the village following steps were suggested : (i) every loan should be related to a specific production (ii) provision should be made in the by-laws requiring every borrower to sell his surplus produce through the nearest marketing society ; (iii) the borrower should provide sureties ; (iv) a specific statutory charge should be created on the crops for the short-term loan given ; and (v) there must be close supervision over the use of loans.

In pursuance of the recommendations, an *Expert Committee on Co-operative Credit* was set up under the Chairmanship of Late Shri V. L. Mehta to consider different aspects of the question of expanding agricultural credit, including standards for credit limits, loan policies and practices of co-operative credit institutions, measures necessary for increasing the borrowing power of primary credit societies and the desirability of share capital participation by the State in the village societies.

Jaipur Conference of State Ministers, 1960

The Fourth Conference discussed some of the aspects of co-operative credit and marketing. The Conference emphasised that : (1) for a substantial increase in agricultural production much larger funds would be required for the use of medium-term loans and that, therefore, the Reserve Bank might consider the question of making larger funds available for the purpose ; (2) the medium-term loans upto a reasonable limit should be advanced by the co-operatives without mortgaged security and that expansion of rural credit could be possible only to the extent marketing societies undertook marketing and processing activities ; (3) progress in the organisation of societies and ensuring adequate membership was inextricably linked with the availability of more funds for the issue of production loans by the co-operatives.

Committee on Co-operative Credit, 1960

This Committee reported in 1960. Its findings were :

(i) In organising village societies the aim should be to ensure viability with the inclusion of the smallest number of villages necessary. The extension should be subject to the maximum limit of a population of 3,000 and a distance of not more than 3 to 4 miles from the headquarters village. This is necessary in order that the co-operative society achieves both viability and the essential characteristics of cooperation, namely, voluntary basis, contact, close social cohesion and mutual obligation.

(ii) As a general rule co-operatives should be organised on the basis of village community as the primary unit ; where villages were too small, the number of villages to be served by a co-operative society might be increased, in the interest of viability.

(iii) The State may participate in the share capital of viable primary agricultural credit societies on a matching basis, such participation ordinarily being limited to Rs. 5,000 and up to a maximum of Rs. 100,000 in exceptional cases.

(iv) Co-operative institutions must expand their range of credit and distribution operations. They must strengthen themselves and collect share capital and deposits on a very large-scale ; membership must be increased substantially and credit and services provided to the members.

(v) A programme for reorganisation and revitalisation of primary societies was to be taken up with a view to making them viable economic units with necessary full time trained paid staff.

(vi) Co-operative marketing societies should be developed on a very large scale and linking of credit with marketing should be secured and for this purpose the construction of godowns by primary credit societies should be taken up.

(vii) Efforts should be made to augment the internal resources of the co-operative movement by attracting more deposits.

(viii) Reserve Bank should liberalise its lending policies.

(ix) Special funds as recommended by the Rural Credit Survey Committee should be constituted and quickly built up.

(x) Departmental and other staff should be augmented and adequate arrangements for their training made.

(xi) Machinery for effective and efficient supervision and audit should be improved.

Working Group on Panchayat and Cooperatives, 1961

A Working Group was appointed, under the Chairmanship of Shri S. D. Misra : (i) to study the working of Panchayati Raj and

its impact on co-operation in some selected states ; (ii) to suggest measures whereby co-operatives and panchayats can perform their respective roles without conflict and strengthen one another ; (iii) to study demarcation of responsibilities between the panchayats and co-operatives and (iv) to suggest measures for securing coordination between the two.

This Committee recommended, *inter alia*, that ; (i) the panchayats should have an important role in the movement and should disseminate information, help in increasing membership, deposits and share capital and should enlist the support of every family in their area ; (ii) even though the panchayats should have the over-all responsibility for planning, functions of co-operatives to be carried out on business principles should be handled by the co-operatives while as a rule functions involving a heavy element of subsidy or schemes which are not self-financing immediately should be handled by the panchayats ; (iii) functions calling for community effort or the entire village should fall within the area of the panchayats ; (iv) where co-operatives are not yet strong and broad based, some of the functions of the co-operatives should be discharged, as an interim measure, by the panchayats, and (v) The Zila Parishad—Panchayat Samiti will exercise general supervision as distinct from technical, to the extent necessary.

Committee on Co-operative Administration, 1963

In pursuance of recommendation made by the Fifth Conference of State Ministers in Lucknow, 1963, a Committee on Co-operative Administration (under the Chairmanship of Shri V. L. Mehta) was set up. This Committee studied the co-operative departmental set-up in the various States and suggested measures necessary to strengthen co-operative administration in the country. It also studied the question of 'cadres' for the increasing number of co-operative institutions that are coming up in different sectors of the economy.

Co-operation During The Third Plan

The Third Five Year Plan observed "In a planned economy pledged to the values of socialism and democracy, co-operation should become progressively the principal basis of organisation in many branches of economical life, notably in agriculture and minor irrigation; small industry and processing, marketing, the provision of essential amenities for local communities, distribution, supplies, rural electrification, housing and construction." Accordingly, the entire rural economy was to be reorganised on a co-operative basis and this included provision of services such as credit, marketing, storage and distribution, co-operation in production and diversification of the occupational structure.

The main provisions in the Third Plan were :

- (i) that the agricultural credit movement should cover all the villages and 60 per cent of the agricultural population by 1965-66
- (ii)

Primary agricultural credit societies should be revitalised to make them viable units. (iii) co-operative credit to the tune of Rs.530 crores for short and medium-term and Rs. 150 crores for long term agricultural needs should be provided for (iv) Co-operative marketing, processing and linking of credit with marketing should be emphasised. (v) The consumer co-operatives should be the channel through which essential commodities are distributed in urban and rural areas. (vi) Small industries should be developed on co-operative lines. (vii) The personnel of co-operative department should be strengthened at different levels. (viii) Non-credit co-operatives like housing farming, fishing, dairying etc. should be given due emphasis.

The targets suggested in the Third Plan are given below :

	At the end of 1960-61	Targets for 1965-66
No. of primary co-op societies	2.1 lakhs	2.3 lakhs
Membership	1.7 crores	3.7 crores
Coverage of villages		100%
Coverage of agricultural pop.	33%	60%
Loans to be issued through co-ops ;		
Short term and medium term	Rs. 208 cr.	Rs.530 cr.
Long-term	Rs. 37 cr.	Rs. 150 cr.
Service Co-operatives :		
by new organisation		28,750
by reorganising existing soc.	—	52,180
Primary Land Mortgage banks	—	265
Organisation of new marketing societies	—	600
Godowns of new marketing societies	—	900
Rural godowns	—	9,200
Co-operative sugar factories	—	25
Other processing societies	—	783
Co-operative farming societies	—	3,200

Evaluation

By the end of the Third Plan, the primary agricultural credit societies covered about 89% of the villages. Leaving aside the dormant societies (which numbered 23,680 and which served, 45,352 villages) the movement covered about 82% of the villages. The total number of societies stood at 191,904. More emphasis was laid on making the societies viable than on their expansion. Majority of agricultural credit societies were weak and inefficient inspite of their revitalisation programme. About 31% of the societies worked at

loss. Nearly 80 per cent of the audited societies were classified as 'C', 'D', or 'E'. The total number of membership of all types of agricultural credit societies was 26.1 m. The societies covered about 33% of the agricultural population.

The short and medium term credit supplied by the credit society amounted to Rs. 341.65 lakhs, and that for long-term credit to Rs. 163.26 as against a target of Rs. 530 and 150 crores respectively.

The co-operatives handled foodgrains worth Rs. 136.75 crores as against a target of Rs. 360 crores. In the field of co-operative processing, 582 units were established. Besides there were 78 co-operative sugar factories, 155 cotton ginning and processing societies, 329 paddy husking societies, 142 rice mills, 298 oil crushing societies, 22 fruit and vegetable societies. The number of co-operative stores increased from 7058 in 1960-61 to 13,077 in 1965-66, and their membership from 13.41 lakhs to 29.30 lakhs, and the sale proceeds from Rs. 44 crores to 198 crores.

Report of the Committee on Cooperative Marketing, 1964.

An Expert Committee was appointed in 1964 under the chairmanship of Dr. Dantwala to : (i) review the present pattern of co-operative marketing of agricultural produce (ii) distribution of production requisites and supply of consumer articles, (iii) to indicate the future pattern of development with particular reference to *inter se* relationship between the organisation at different levels; and (iv) to indicate the role of co-operative marketing in an integrated structure of credit, supplies and processing etc.

The Committee emphasised that all primary agricultural credit service societies in the area of operation of a primary marketing society should be affiliated to that society. This should be possible through a phased programme and each of these societies should be required to contribute to the share capital of the marketing society, at the rate of 2 per cent of its annual turn-over in the preceding operative year. Efforts should also be made to collect annually 1 per cent of the value of sale by each member, towards the share capital of the society irrespective of the fact whether the produce was brought by him direct or through a credit society.

The other more important recommendations of the Committee were :

- (1) The future pattern of organisation of marketing co-operatives should be two-tier structure with apex society at the State level, primary marketing societies at the mandi level, and branches of apex marketing society at district or regional level. (2) In states where a three-tier structure already exists, the existing District Federation should not be disturbed. (3) The marketing co-operatives should undertake both agricultural marketing and the distribution and supply functions. (4) Immediate steps should be taken to locate the

primary marketing societies at the mandi level. (5) The membership of the primary marketing societies should consist of mixed type—i. e. of the village service/credit societies and individual growers.

Committee on Co-operation, 1964

Another Committee under the chairmanship of Shri R. N. Mir-dha was also set up in 1964 : (i) to lay down standards and criteria by which the genuineness of co-operative societies of different types may be judged, (ii) to suggest measures for weeding out nongenuine societies and preventing their registration, (iii) to review the existing co-operative laws, rules and practices to locate the loopholes which enable the vested interests to entrench themselves in co-operative institutions and recommend measures for the elimination and prevention of such vested interests.

The Committee reported in 1965. Its main recommendations were :

(i) Money-lenders should be prohibited from obtaining membership of agricultural credit societies. (ii) Agricultural commodity traders should not be admitted to agricultural marketing societies as full fledged members. (iii) Contractors should be prohibited from being members of labour co-operatives. (iv) Only workers, traders and machinists should be allowed to be the members of transport co-operatives, and the membership of industrial societies should be confined to workers and artisans. (v) Membership of housing co-operatives should be restricted to persons having incomes not exceeding certain ceilings to be prescribed. (vi) Audit of co-operative societies should be entrusted to an agency under the Govt. (vii) National Co-operative Bank may be set up as the apex of the co-operative credit structure, to promote self-reliance of the co-operative movement. (viii) The Central and State Governments should assist the co-operatives in a much liberal way.

Co-operation During the Fourth Plan

The Fourth Five Year Plan stated that "It is important for planned development to bring about growth of cooperatives in all parts of the country to ensure the coordinated operation of various types of co-operative organisation." As such, agricultural cooperatives and consumer cooperatives were given a central position in the strategy of cooperative development. For agricultural development credit, inputs and services were all to be provided by the cooperatives.

During the Fourth Plan, it was decided that (1) : (i) to reorganise the primary credit societies by making them viable units; (ii) to rehabilitate and reorganise weak district central cooperative banks ; (iii) to finance primary societies directly by the concerned Apex cooperative banks; (iv) to reduce overdues, (v) to strengthen the agricultural credit stabilization funds; (vi) to provide trained and competent staff for the supervision of primary societies, (vii) to

encourage deposits, co-operative banks were required to open more branches in the rural areas; (viii) to provide for Rs. 750 crores by way of short and medium-term credit to the cooperatives, Rs. 900 crores by way of long-term credit. (2) Policies and procedures of credit cooperative and land development bank was to be oriented in favour of small farms. (3) Cooperatives were envisaged to handle agricultural crops worth Rs. 900 crores. Besides they were also to handle agricultural commodities worth Rs. 25 crores in inter-state and Rs. 10 crores in the export trade. 550 processing units were to be set up. (4) The cooperatives were expected to handle fertilizers worth Rs. 650 crores, improved seeds worth Rs. 50 crores, pesticides worth Rs. 50 crores and implements worth Rs. 15 crores. (5) The Cooperatives were to establish an additional storage capacity of about 2.0 m. tonnes. (6) Consumer stores were required to distribute consumer articles worth Rs. 500 crores. (7) Other types of cooperatives were also to continue to receive attention. (8) Weak cooperative farming societies were to be revitalised and new societies organised only in compact areas if they have a potential for growth.

Targets to be Achieved During the Fourth Plan

Units	Levels Achieved			Levels anticipated (Estm) in 1973-74
	1960-61	1965-66	1968-69	
1. Membership of primary agr. credit societies million	17	26.1	30	42
2. Coverage of agr. families %	30	42	45	50
3. Short % medium terms loans				
advanced Rs. Cr.	202	342	450	750
4. Long term loans advanced "	11.6	50	100	700
5. Agr. produce marketed by Coops"	175	360	475	900
6. Coop. Agr. Processing Units No.	1004	1500	1600	2000
7. Fertilizers to be retailed by Coops. Rs. Cr.	28.2	80.1	260	650
8. Storage m. tonnes	2.3	2.4	2.6	4.6
9. Distribution of consumer articles in rural areas Rs. Ct.	16.7	198.1	275	500
10. Retail sales of urban Consumer Co-ops, Rs. Cr.	40	200	275	400

Conference of State Ministers of Cooperation, 1969

A Conference of the State Ministers of Co-operation was held in June-July, 1969 at Bangalore. It reviewed the main trends in the growth of the cooperative movement, stressed the need for the co-operatives to reorient their policies and programmes in the context of the new strategy for agricultural development and outlined measures for strengthening and diversification of cooperative activities.

The suggested measures included : (i) speedy implementation of the recommendations of the 1968 Conference of Chief Ministers and Ministers of Cooperation for curbing vested interests in cooperatives ; (ii) formulation of objective and production oriented loaning policies and procedures by cooperatives, particularly for the benefit of small farmers ; (iii) speedy implementation of the programme of revitalisation of primary agricultural credit societies and rehabilitation of Central Banks ; (iv) effective implementation of the common cadre scheme in different sectors of cooperation with legislative support ; (v) orientation of the operations of land development banks to assisting small farmers whose holdings can become economically viable units with the availability of development capital. (vi) building up trained and competent cadres of managerial and technical personnel within marketing and processing structure within the shortest possible time ; (vii) Consumer co-operatives should continue getting priority and adequate funds to hold the price line ; (viii) consolidation of the programme of cooperative farming for improving productivity in agriculture ; (ix) greater emphasis should be laid on practical training and in full utilization of already trained personnel ; and (x) measures to ensure better coordination between various sectors of the movement should be devised so that an integrated development of the movement as a whole is made possible.

All-India Rural Credit Review Committee, 1969

This Committee was set-up under the Chairmanship of Sri B. Venkatappiah to suggest measures for the reorganisation of rural credit. It suggested ; (i) the establishment of an Agricultural Credit Board ; (ii) Setting up of a Small Farmers Development Agency in each of a number of selected districts throughout the country ; (iii) Creation of a Rural Electrification Corporation for the benefit of underdeveloped areas with an agricultural potential ; (iv) formulation of a more active and much bigger role for the Agricultural Refinance Corporation ; and (v) adoption of various measures for ensuring the Agricultural Refinance Corporation ; and (vi) adoption of various measures for ensuring the timely and adequate flow of credit for culture through co-operative and commercial banks.

The Report of this Committee covered the entire range of agricultural credit and suggested measures for development of various institutional agencies for servicing agricultural production programme.

As per the recommendation of the Committee, 45 *Small Farmers' Development Agencies* in selected districts were set up to serve small farmers more effectively. *Rural Electrification Corporation* was also set up in 1969 to promote and finance the rural electric cooperatives organised to take up distribution and extension of electricity in their areas of operation. 41 *Pilot Projects* were set up for the development of larger class of sub-marginal farmers and agricultural labour.

The emphasis was put on developing institutional agencies to meet the growing needs of agricultural credit. Cooperatives continued to be the main institutional source for agricultural credit, accounting for 33 per cent and commercial banks 5.3%. The short and medium term loans advanced by primary credit societies increased from Rs. 429 crores during 1967-68 to Rs. 486 crores in 1968-69. Land development banks also made progress. Long-term loans disbursed by these banks increased from Rs. 94 crores in 1967-68 to Rs. 129 crores in 1968-69.

Significant progress was recorded in other fields of co-operative activity. The cooperatively organised processing of agricultural produce, mainly in the sector of sugar factories, made considerable expansion in production. Cooperatives distributed agricultural inputs to the value of Rs. 230 crores in 1967-68 and Rs. 250 crores in 1968-69. Co-operatives handled nearly 60% of the total intake of fertilizers in the country. The total value of agricultural produce handled by marketing and processing co-operatives increased from Rs. 525 crores in 1967-68 to Rs. 580 crores in 1968-69.

The performance of the Fourth Plan presents a mixed picture. In respect of cooperative marketing of agricultural produce the target was of the value of Rs. 900 crores but it actually exceeded to Rs. 1000 crores.

In respect of cooperative credit and cooperative storage, the targets were substantially achieved. The targets were Rs. 750 crores and 38 lakh tonnes. The over-all progress of all types of co-operatives is given below :

Over-all Progress of Cooperative Movement

Periods/Year	No. of societies (lakh.)	Membership of primary societies (Lakhs)	Share capital (Rs. crores)	Working capital (Rs. crores)
Beginning of I Plan (1950-51)	1.8	137	45	276
II Plan (1955-56)	2.4	176	77	469
III Plan				

(1960-61)	3.3	378	260	1,535
1965-66	3.5	503	450	2,800
1967-68	3.3	544	586	3,682
1968-69	3.3	585	663	4,473
1969-70	3.2	588	753	5,156
1970-71	3.2	591	851	6,810
1971-72	3.2	614	944	7,695
1972-73	3.3	678	1,051	8,585
1973-74	3.3	692	1,226	9,648
1974-75	3.3	695	1,274	11,278
1975-76	3.3	752	1,369	12,146

Cooperation in The Fifth Plan

The major objective of the Fifth Plan was to build up a strong and viable cooperative sector with special emphasis on the needs of cultivators, workers and consumers. The cooperative development was to achieve four specific objectives, viz : (i) to strengthen the net work of agricultural cooperatives (credit, supply, marketing and processing) so as to bring about agricultural development ; (ii) to build up a viable consumer cooperative movement ; (iii) to remove regional imbalances in the level of cooperative development particularly in the sphere of agricultural credit; and (iv) to restructure and reorientate the cooperatives so that these become more useful to small farmers and tribal people. A provision of Rs. 376 crores was made for cooperative development during the plan period.

Fifth Plan Cooperative Targets (Rs. crores).

Particulars	Base level (1973-74)	Target (1978-79)
Short term loans	700	1,300
Medium-term loans	200	325
Long-term loans	900	1,500
Value of Agr. produce to be marketed by cooperatives.	1,100	1,900
Cooperative processing units (Nos.)	1,500	2,150
Capacity of cooperative storage	33 lakh tons.	68 lakh tons.
Value of consumer goods to be marketed by cooperatives.	Rs. 300 crores	Rs. 600 crores.
Value of fertilizers to be marketed by cooperatives.	Rs. 350 crores	Rs. 380 crores.

(Draft of the Fifth Five Year Plan, Vol. II)

New Co-operative Policy Resolution, 1977

On the basis of the deliberations held at the Annual Conference of the Registrars of co-operative societies and the State Ministers' Conference in 1977, a new National Co-operative Policy Resolution has been adopted. This Resolution says :

- (1) Co-operation shall be built up as one of the major instruments of decentralised, labour intensive, and rural-oriented-economic development.
- (2) Co-operatives at all levels shall be closely associated with the process of planning for economic development and social change.
- (3) The co-operative movement shall be developed as a "shield for the weak." Small and marginal farmers and agricultural labourers, rural artisans and ordinary consumers belonging to the middle and lower income groups shall be provided the maximum scope to participate in the co-operative programmes and a massive effort will be made for the involvement of millions of the masses in the co-operative movement.
- (4) Co-operative development shall be promoted on a national basis, and regional imbalance, in co-operative development shall be progressively removed.
- (5) The co-operative movement shall be built up as an autonomous, self-reliant movement, free from undue outside interference and excessive control, as also from politics. The autonomy of the co-operative shall be based on increasing generation of internal resources, mobilising savings in rural and urban areas, and decreasing dependence on resources from outside financial institutions.
- (6) A voluntary democracy shall be built up based on enlightened participation of broad-based membership, free from the domination of vested interests.
- (7) Co-operative movement shall be cleansed of corruption and malpractices which spoil the fair name of co-operation and harm the very principles for which the movement stands.
- (8) In the rural areas, a strong, viable and integrated co-operative system shall be built up to promote total and comprehensive, rural development by progressively strengthening the links between credit, supply of agricultural inputs, agricultural production including ancillary activities like dairy, poultry, fishery and piggery, marketing and distribution of essential consumer articles.

- (9) A net-work of co-operative agro-processing and industrial units shall be built up to provide gainful and economic links between the growers and the consumers.
- (10) Co-operatives shall be promoted as efficient institutions with streamlined organisation and simple and rationalised procedures.
- (11) Professional management shall be built up in co-operative institutions through a sustained programme of recruitment of suitable personnel and their systematic training.

According to this New Policy Co-operation has been assigned a pivotal role in the process of national planning and development. Co-operation was conceived as an instrument for encouraging decentralisation and local initiative in the developmental process, keeping in view the overall purpose of having a society, based on values of democracy and socialism. The planned development over the past several years has unfortunately led to centralised urban-oriented and capital intensive economy. The absence of adequate employment opportunities, especially in rural areas, has further accentuated poverty, amongst the small and marginal farmers, agricultural labourers and other weaker sections of the community. In view of this, the economic policies and programmes had to be reformulated so as to achieve the goal of promoting decentralised, labour-intensive and rural-oriented economic development. With the shift of accent on development from industry to agriculture, a need was felt to give a new orientation and direction to co-operative policies and programmes.

The Draft Five Year Plan (1978-83)

In pursuance of this policy, under the Draft Five Year Plan, 1978-83, the following programmes have been envisaged.

- (a) Credit will be made available to the farmer, the artisan etc. for their short, medium, and long-term requirements at one place close to their own village. This is to be done through the Multi-purpose primary Co-operatives on the lines of the Farmers Service Societies or the Large-sized Multi-purpose Societies.
- (b) For reorganisation and reorientation of the co-operative system, the following steps shall be taken :
 - (i) Reorganisation of primary agricultural credit societies into strong and viable multipurpose units.
 - (ii) Efficient management of the reorganised societies by professionally trained full-time paid managers/secretaries.
 - (iii) Simplification of the loaning procedures and arrangements to issue passbooks with authorised credit limits to farmers, etc. to facilitate the supply of credit according to their periodic requirements.

- (iv) Reduction of overdues in the co-operative institutions for which vigorous steps should be taken by the State Government.
- (v) Greater reliance of commercial banks on financing primary credit societies.
- (vi) Provision of a godown to each reorganised society to enable it to undertake activities like supply of inputs and essential consumer goods and marketing of agricultural and other produce.
- (vii) The higher level institutions would be suitably strengthened so as to be able to supervise and guide the lower level institutions. Stress would be laid on the mobilization of larger deposits and removal of regional imbalances in co-operative development.

Thus during the Five Year Plan, efforts will be made for the orientation of credit policy in favour of the weaker sections of the society, and specific policies would be framed to reduce the rate of interest chargeable from these sections of the village community.

This Plan has provided for Rs. 475 crores for co-operation as against Rs. 376 crores during the Fifth Plan. The Plan outlays relate to five co-operative development programmes, viz.

- (i) Assistance to N C D C for programmes of co-operative processing, storage and marketing of agricultural produce and distribution of inputs, as also distribution of consumer goods in rural areas through co-operatives ;
- (ii) Development of consumer co-operatives ;
- (iii) Assistance to co-operative federations and administration of multi-unit Co-operative Societies Act,
- (iv) Co-operative training and education, and
- (v) Co-operative fertilizer production.

As against the actual expenditure of Rs. 35.89 crores on co-operative plan schemes in 1976-77, the anticipated expenditure for 1977-78 is Rs. 28.47 crores ; and Rs. 33.72 crores for 1978-79.

Evaluation of, and the Government Aid to Cooperation

The General Progress. Over 75 years have passed since the co-operative movement was first launched in the country. It has not been the panacea. It was hoped to cure all economic and social evils from which cultivators suffer. Even then it must be admitted that the movement has led to some beneficial results. Let us see how far the movement has succeeded in achieving the objectives for which it was started.

Since Independence, substantial progress has been made by the movement. It now covers about 97% of the villages, 47% of the rural population and about 45% of all agricultural families. In states like Maharashtra, Gujarat, Tamil Nadu, and Kerala, nearly every village has a cooperative society. It is through it that not only credit is supplied for agricultural production but also other services too.

There has been a steady increase in the number of societies, their membership and total working capital since Independence. These increased from 1.8 lakhs to 3.1 lakhs; membership from 1.37 crores to 7.42 crores and working capital from Rs. 276 crores to Rs. 12,146 crores between 1950-51 and 1976-77. The credit supplied by the Cooperatives increased from 3.1% in 1950-51 to 36% in 1976-77.

The short and medium term loans advanced by primary agricultural credit societies increased from Rs. 203 crores in 1960-61 to Rs. 153.35 crores in 1976-77. The long-term loans advanced by the Cooperative Land Development Banks, increased from 11.62 crores in 1960-61 to Rs. 242.31 crores in 1976-77. Besides, production-oriented crop loans system is also in operation in most parts of the country.

Every state has now an Apex Bank which acts as a clearing house and a balancing centre and the highest financing agency for the Cooperatives in the state. Their number increased from 15 in 1950-51 to 26 in 1976-77. The share capital increased from Rs. 1.58 crores to Rs. 70.79 crores, and the loans advanced increased from 42.13 crores to Rs. 171.71 crores.

The Central Cooperative Banks, at the district level were 505 in 1950-51. As a result of reorganisation of the weak units, their number was 343 in 1976-77. But their share capital increased from Rs. 4.04 crores in 1950-51 to Rs. 248.66 crores in 1976-77, and the loans advanced from Rs. 82.83 crores to Rs. 1807.94 crores.

Besides credit, cooperative movement has also diversified its activities. These marketed agricultural produce to the value of Rs. 1189.14 crores in 1976-77 as against Rs. 174 crores in 1960-61. Cooperatives have now also entered into the field of medium and large industries like cooperative spinning, sugar cooperatives, fertilizers etc.

The cooperative movement has been extended to the national level for various sectors of the movement. It has also pervaded into other non credit sectors the consumer stores, industrial cooperatives, dairy and labour cooperatives etc.

In sum, the cooperative movement has rendered some useful services for the economic improvement and welfare of the rural and urban population. Much prosperity has been brought to the villages in Maharashtra, Tamil Nadu, Gujarat and Kerala.

ACHIEVEMENTS OF THE MOVEMENT

The achievements of the movement may be discussed under four heads thus :

(1) Economic benefits, (2) Social and moral benefits, (3) Educational benefits, and (4) Other benefits.

1. Economic Benefits

(i) **Supply of Cheap Credit.** The movement has not only freed the cultivators from the clutches of the money-lenders but it has also compelled them to bring down the rates of interest on account of competition from the credit societies, which supply loans at relatively low rates of interest. The Fourth Plan has rightly said, "the cooperatives have been successful in freeing the middle peasant from the moneylender trader system and making him development-minded."¹

(ii) **Spread of Banking Habits.** Prior to the development of Central or Urban banks in the towns, facilities for banking for people of modest means were practically absent. Neither the commercial banks nor the Imperial Bank catered to their needs. But with the establishment of the Cooperative Banks the persons of small means began to be attracted to put their deposits in these banks. *Banking habit has been taken to the countryside through establishment of branches at many centres of prosperous agriculture.*

(iii) **Benefits to Agriculture.** The cooperative societies have played an important role in popularising improved seeds, good cattle breeds, fertilizers, implements and pesticides. *They are thus helping in the realisation of the ideal of "better farming, better business and better living."*

1. *Fourth Five Year Plan*, p. 23.

(iv) **Better Prices to Cultivators.** The cooperative marketing and processing societies are helping cultivators in getting better prices for the produce, and have saved them from the exploitation of the middlemen. The marketing cooperatives have also been useful in implementing the government's food policy by making large scale purchase of food grains and their distribution.

(v) **More Employment.** The Industrial Cooperatives have safeguarded the interest of the poor artisans against exploitation of the middlemen. They have also helped in creation of new employment opportunities, increase in competitive strength and efficiency of the artisans.

(vi) **Distribution of Essential Commodities.** During the days of emergency, rationing and periods of shortages, the consumers stores supply commodities of good quality and unadulterated merchandise at reasonable prices.

(vii) **Provision of other non-credit societies.** Many cooperative societies have improved the economic conditions of their members. The cotton sale societies in Maharashtra and Gujarat, the irrigation and milk societies in West Bengal, the cooperative seed and dairy societies in M. P., consolidation of holding societies in Punjab; sugarcane supplies societies in U. P. and Bihar; gur societies in Maharashtra and cooperative dairy in Gujarat have done much useful work.

(viii) **Encouragement of Thrift and Savings,** Many cooperative societies, through restrictions on wasteful expenditures by their members, have included the habit of savings among them. The total deposits of the urban credit societies have increased from Rs. 35 crores in 1950-51 to Rs. 375 crores in 1976-77.

2. Social and Moral Benefits

Cooperation constitutes an admirable means of popular social improvement. Such social benefits are :

(i) Cooperative societies tend to check petty quarrels and bitterness of village life, bind them together in friendly relationship and train the people to work in comfort for common ends.¹

(ii) "Litigation and extravagance, drunkenness and gambling are all at a discount in a good cooperative society and in their place is now found industry, self-reliance and straight dealing, education and arbitration, thrift, self-help and mutual-help."²

(iii) Cooperation relies on the character of the members so it fosters a sense of responsibility, integrity and diligence.

1. Mukerjee, R. K., *Foundation of Indian Economics*, 1930, p. 430.

2. Darling, M. L., *Punjab Peasants in Prosperity and Debt*, p. 150.

(iv) As an effect of cooperation, the idle men become industrious, the spendthrift thrifty, the drunkard reforms his ways and becomes sober. The haunter of taverns forsakes the inn, the illiterate learns to read and write.¹

3. Education Benefits

The cooperative societies have brought benefits of training in business methods to their members. In good working societies, the members take an active part in its working, keep a watchful eye on the way in which members utilize the loans and pass the accounts presented by the Governing Body. Thus, the ordinary members get a training in the use of money and its control and the members of the Board of Management get training in keeping the accounts. In fact, primary cooperatives can be regarded, according to Dr. M. L. Darling, "as a net work of elementary schools in rural finance."²

4. Other Benefits

Cooperative societies provide opportunities to its members to learn the art of running democratic institutions. They also encourage the creation of local leadership who could be entrusted with the task of running cooperatives. They also develop responsibility and honesty of purpose in their members.

NEGATIVE SIDE OF THE MOVEMENT

In spite of the above benefits and the increase in number of societies, in membership and in working capital, it has been the observation of experts in the field that cooperative movement has not succeeded in achieving the objects for which the societies were started, as would be noted from the quotations given below :

"Cooperative movement in India had not fulfilled the hopes and expectations of the people"³—Dr. P. S. Loknathan.

"The movement has failed to deliver the goods. The development has been lop sided and has by and large furthered the interests of the richer class at the cost of the poorer sections of the society." Dr. D. R. Gadgil.

"Cooperation has failed to bring even succour to the poverty-stricken peasants, artisans and small traders. It has more and more become a combination of the strong, not for the weak but against them."⁴

"The credit cooperatives have not to any significant extent served the poorer classes in Indian villages. The benefits to be derived from cooperation in the marketing of output, processing of

1. Wolf, H., *The People's Bank*.

2. Darling, M.L., *Punjab Peasants in Prosperity and Debt*, p. 261.

3. *Hindustan Times*, dated 16th Nov., 1955.

4. Gyan Chand, *Socialist Transformation of Indian Economy*, p. 324.

crops, or purchasing of such inputs as fertilizers and improved seeds flow mainly to the limited group that has a marketable surplus to sell."¹

These quotations clearly indicate that the cooperative movement has failed in achieving the main objectives, i.e. of improving the life of the villagers to any appreciable extent. This would be further clear from the facts given below :

(1) In the opinion of the *Rural Credit Survey Committee*, "agricultural credit, as it is at present supplied, falls short of the right quantity, is not of the right type and by the criterion of need often fails to go to the right people." In other words, it may be said that cooperative credit mainly reached the wealthy farmers, whereas much smaller portion went to the small cultivators. The Survey conducted by the Programme Evaluation Committee of the Planning Commission has revealed that "about 15% of the cooperative credit had gone to those having 5 acres or less; 39% to those having 5 to 10 acres; and 46% to still larger land-holders." Thus, *the cooperative credit movement has played an insignificant role in the field of rural credit.*

(2) Even now, *cooperative societies are dominated by village money-lenders and big land lords and other vested interests.* This has created a feeling of apathy in the minds of small farmers about joining these societies. Further, group rivalries and inefficient management has also kept small farmers away from these societies.

(3) *A large number of societies are dormant and simply adorn the records of the cooperative departments.* Because of this situation, the extent of effective coverage of the movement has not been large. About 53% of the rural population is yet out of the cooperative fold. Cooperatives have not served the needs of cultivators for more than 20% of the total. This is proved by the fact that in a large number of States (except Maharashtra and Gujarat) the proportion of co-operative credit to total borrowings of cultivators has remained small.

Loans overdue as percentage of loans outstanding has been consistently increasing, from 22% in 1950-51 to 42% in 1976-77. Loans overdue increased from Rs. 6.38 crores to Rs. 611.78 crores during the same period.

It may, therefore, be said that by all accounts the cooperative movement has not lived upto the expectations of its sponsors. In the words of Dr. Gyan Chand, "The movement has not materially reduced the burden of the cultivators' debts, and the dependence on the moneylenders or improved their productivity, income and position and increased their self-reliance, resourcefulness or capacity for concerted action."

The main shortcomings of the cooperative movement are the inadequacy of credit supply, the rising overdues, inefficient manage-

1. Myrdal, Gunnar, *Asian Drama*, Vol. II, pp. 1336-1338.

ment, domination of cooperatives by vested interests, undue reliance on honorary service, lack of effort to mobilize deposits; untrained staff, illiterate members, certain policies and procedures which are not suitable to local environment and the weak arrangements for linking of credit with marketing.

WEAKNESSES OF THE MOVEMENT

It has been observed that cooperation in India has not been a living, dynamic force contributing to the moral, intellectual and economic improvement of the rural masses. It has not become with the cultivators a "way of life", but has remained a Government agency from which they can obtain cheap credit. The very slow progress of cooperative societies for purpose other than credit (e.g. societies for consolidation of holdings, joint cultivation of land, for purchase and sale of products) proves that the real message of co-operation (i.e. "self help and mutual association of common economic good") has not been grasped by the cultivators.

Causes Which Have Retarded the Growth of the Movement

Various causes have been responsible for the weaknesses and poor performance of the cooperative movement. According to the *Rural Credit Survey Committee*, "the more fundamental causes of the failure of the movement were economic and socio-economic.... The administrative, structural and functional weakness and the educational and technical backwardness are subsidiary forms of symptom rather than the main disease."

Some of the important factors that have retarded the development of the movement are :

1. Lack of Spontaneity

The urge of the cooperation has come from the Government and not from the people themselves. While in countries like Germany, Ireland and Italy, Cooperatives were organised by cooperative enthusiasts like Raiffeisen, Horace Plunket, and Luzzati, but in India, the movement was started by the Government as a remedy to solve the problem of rural indebtedness, and the organisation was entrusted to the official Registrars. *The movement was started by Government initiative, kept in order by Government audit and financed by Government credit, has remained till recently an official movement.* In the words of F.A.O., "In India a cooperative society has become a semi-state organisation in which there is hardly any initiative, auto-activity," autonomy, not to speak of auto-finance, on the side of the members." According to Dr. Hough, "It has been a Government initiated and Government fostered effort, leaving the poor people without alleviation of their sufferings which cooperation can bring about."

Thus, the lack of spontaneity in the Indian cooperative movement is admittedly one of its greatest inherent weaknesses. Sir

Horace Plunket remarked, "with an exception of a few genuinely cooperative cases, cooperation is not so much a movement as a Governmental policy." He emphasised that "greatest obstacle to the self-reliance was the habit of looking to the Government to do for us things which we can and ought to do better for ourselves." The continuance of the State control at every step has been damaging to the highest interest of the movement.

2. Lack of Knowledge of Principles of Cooperation

In practice, societies are constantly found in which most or even all the members are largely illiterate and ignorant of cooperative principles. According to Dr. Darling (1957) "it has been still the rule rather than the exception for Registrars to be appointed without any training at all. This practice is indefensible and deplorably short-sighted and no Registrar should be appointed without sufficient training." Neglect of education in cooperative principles and practice, for departmental officials, honorary workers as well as office-bearers, staff and members of the cooperative societies has exacted a heavy toll. These personnel are not capable of properly discharging their duties. Lack of training and of the understanding of the cooperative principles is responsible for the chief defects of the members. In the absence of education, even the simplest rules and principles cannot be got in the heads of the illiterate people.

All that these societies mean to the cultivators is that "they are a bank from which they can get money at a cheaper rate, that there is no hurry in repaying the loans, and that it does not matter much if the loan is utilised for some other purposes than for which it was taken." People, therefore, join societies only to get loans or scarce commodities, to secure some other privileges and as soon as these purposes are achieved, the membership may be left

3. Inefficient Management

The management of the societies is very inefficient due to lack of trained and qualified personnel. As a result of this the societies suffer from lack of proper accounting practices, irregularities of loans, and maintenance of false records. Loans are granted recklessly and extensions given without reasonable causes. Managing committees and chairman are too often allowed to usurp all power, and the office bearers often find themselves helpless and lack moral courage in dealing with the faults and misdemeanours of the members. Very often the members of the Board of Management are themselves defaulters and no prompt action is taken against them. Even where defects are obvious and admitted, there is reluctance to liquidate societies whose condition is beyond remedy. Further concentration of control into the hands of fewer members prevents smaller producers from getting adequate credit.

According to Rural Credit Review Committee, "a major factor of weakness in the working of cooperative credit is that there has been no recognition of the need for following a business-like approach in running these institutions and securing management of the required quality." Since the personnel of the societies is recruited not on the basis of merit but on the basis of pressures and favouritism, so complaints of graft, inefficiency, corruption, accumulation of overdues, fake entries of realisation and advances, lack of owned funds and diversion of funds etc. are often heard.

Thus, the sound and healthy ground of the movement has been retarded due to gross mismanagement and misuse of powers of the cooperatives.

4. Existence of Too Many Dormant and Non-Viable Societies

A fairly large number of cooperative societies (about 25%) ; as also the industrial cooperatives (about 33% of the total) are dormant or weak. The proportion is as high as 60% in Assam and as low as 25% in Orissa. According to Rural Credit Review Committee, "A large number of primary agricultural credit societies are neither viable nor even potentially viable and must be regarded as adequate and unsatisfactory agencies for dispensing production oriented credit."

Most of such societies remain only on paper in the records of the cooperative department. This situation is due to the fact that several of the societies which have been classified as 'active' or 'non-dormant' have in fact been doing only token business and, hence, are not active in the true sense. The *Mirdha Committee on Cooperation* (1965) has said that "this state of dormancy in large number of cooperative societies is a negative aspect of the problem of non-genuineness in cooperative movement." The Committee has emphasised that "a genuine self-reliant cooperative movement cannot grow until and unless this extensive problem of dormancy affecting the vitality of the primary credit structure is satisfactorily tackled."

It appears that inspite of the acceptance of the principle at all levels, that such dormant and non-viable societies should be either amalgamated, liquidated or reorganised serious attention has not been paid to this fact due to local political pressures.

5. Failure to Serve the Needy Strata

This is a general weakness of the movement. Credit is beyond the reach of many whose assets are scanty and is readily available to the few who are men of means. The credit societies are of no use in the poorest districts where the cultivators are most in need of aid. It is worse than useless to give loans to cultivators who are permanently incapable due to fragmentation and subdivision of holdings and climatic or other difficulties. It is only in the most prosperous

areas that credit societies have mostly been successful. Thus, *cooperative credit has become an instrument of accentuating, rather than mitigating, disparities*"

The second important factor is that while there has been an over-all progress in the increase of number and membership of the societies, and expansion in credit, in the country as a whole, the progress in different states continues to be most uneven. The coverage of rural population was only 47% (in 1976-77) in the country as a whole. It varied from as little as 15% in Assam to as high as 84% in Himachal Pradesh 76% in Tamil Nadu. On the basis of coverage of rural population, the areas of cooperative development may be grouped into three categories :

(a) *Cooperatively developed areas*, comprising U. P. (51%), Rajasthan (51%), Tamil Nadu (69%), Punjab (76%), Himachal Pradesh (84%), Karnataka (47%), Maharashtra (67%) and Haryana (47%), i.e. area where the proportion of the rural population covered is over 47%.

(b) *States where cooperatives have yet to cover further populations*, such as Andhra Pradesh (42%), M. P. (32%), Orissa (45%) and Bihar (31%)—i.e. states where the coverage is above 25% but less than 47%.

(c) *States where it is yet in infancy*, such as Assam (15%) and West Bengal (18%).

It may be noted that even within the same State, some inter-regional disparities are found, e.g., in Andhra Pradesh, movement is more developed in the coastal districts than in the interior districts of Rayalseema or Telangana. Similarly, in Orissa, it is more developed in coastal districts than in the western ones.

Of the total credit advanced by the societies, as much as about 60% was provided in six states of Maharashtra, Gujarat, Tamil Nadu, U. P., Punjab and M. P. In contrast to this, the credit movement has been very weak in the Eastern States of Assam, Manipur, Tripura and Nagaland.

Similarly, about 84% of the total agricultural produce sold was contributed by only five states viz., Maharashtra, Gujarat, Punjab, U. P. and Karnataka. The share of the rest of the states was only 16%.

6. Absence of Self Help

Elements of thrift and savings amongst the members has been yet small. According to Dr. Darling, "there seems to be too much emphasis on the need to widen and deepen the channels of borrowing and far too little on the equally important need to encourage thrift and savings." This is evidenced by the low proportion of deposits per member. As against the national average of deposit

per member of Rs. 28 (in 1976-77) a great disparity is found in different states. It was as low as Rs. 5 in Bihar, Rs. 6 in Jammu and Kashmir, Rs. 4 in Tripura, Rs. 8 in West Bengal and Rs. 14 in U. P., Rs. 13 in Orissa to as high as Rs. 162 in Himachal Pradesh and 148 in Punjab, Rs. 97 in Kerala. In Rajasthan it was only Rs. 16; in Maharashtra Rs. 16; in M. P. Rs. 27 and in Gujarat Rs. 48 only.

Even the Central Cooperative Banks and the Apex Banks have failed to attract sufficient deposits from their members.

Thus, *self-help and self-reliance* (which are the chief characteristics of the cooperative movement) *are conspicuous by their absence in India.*

7. Inadequacy of Finance and Defective Loan Policies

The lack of finance available to the members has been another weakness of the movement. Loans are not granted as and when they are required, and also not in sufficient quantity. Sufficient time elapses between a loan application is put and the money actually disbursed. Moreover, loans are often given in one lump sum instead of being paid in instalments. This makes cooperative finance highly inelastic and artificial. Besides, it drives away many members to the moneylenders for getting required amount of loans. This leads to a division of the members' loyalty and weakens the financial position of the society.

Inadequacy of finance arises from various factors such as : (a) want of proper estimates about the cultivators' needs ; (b) arrears of past loans due to unforeseen events like flood, droughts, pestilence and other adversities demand for fresh loans and (c) loans needed for personal consumption purposes which cannot be lent by the societies.

Allied with the inadequacy of finance extensive practice of misutilization and diversion of loans by the members is another problem. According to the findings of the *Programme Evaluation Organisation of the Planning Commission* (1965) nearly 28% of the cooperative credit was diverted by the borrowers to purpose other than those for which it was given; 23% of the short-term and 35% of the medium term credit was so diverted, i.e. used for non-agricultural and non-productive purposes like meeting household needs, payment of old debts and liabilities.

The diversion of short-term credit was significantly high in Rajasthan, Orissa, Kerala and West Bengal ; and that of medium term credit in Andhra Pradesh, Tamil Nadu, Punjab, U. P., Rajasthan, Assam, Orissa and Kerala.

This diversion affects the repaying capacity of the borrowers and it often becomes a cause of overdues and defaults

8. High Incidence of Overdues

Overdues have been rising in all states, which is a matter of serious concern for the cooperatives. This has been especially for two reasons : *first*, till recently the emphasis has been on expansion rather than on consolidation of weak societies. *Second*, the natural calamities which have affected many parts of the country ; making it difficult for the cultivators to repay loans in time.

The all India average for the percentage of overdues to the total outstandings has been 42 in 1976-77. It was as high as 81% in Assam, 77% in Bihar, 48% in Orissa and 56% in Punjab. In Maharashtra it has been 44%, in Gujarat 37%, in Tamil Nadu 23%. It was 39% in Rajasthan.

The position at the Central Co-operative Banks' level was also no better. For the country as a whole the overdues stood at 32% of the outstandings in 1976-77. In some States like Assam and West Bengal overdues formed more than 60% of the total outstanding while in States of Andhra Pradesh, Bihar, Haryana, H. P., Orissa, Punjab and U. P., it ranged between 40% to 60%.

The Study Team on overdues of Cooperative Credit Institutions (appointed by the R. B. I. in 1972) reported in February 1974 that "the lack of will and discipline among the cultivators to repay loans was the principal factor responsible for the prevalence of overdues in cooperatives. Defective lending policy pursued by cooperative, the apathy of management in taking quick decision against recalcitrant members and absence of favourable climate were other contributory factors".

9. Domination of Vested Interests

One of the most disturbing features of the movement is that it is increasingly passing to the hands of the politicians and the vested interests. In most cases, leadership lies in the hands of persons who are not genuinely interested in cooperatives. *Economic Times*, (February 15, 1963) has rightly observed, "If the large scale public sector has become a hobby of senior politicians and bureaucrats, the cooperative movement has turned out to be a handy tool of self-advancement in the hands of petty politicians and district officials. The result has been to convert the movement into the very anti-thesis of cooperation and make it one of the most organised and fast expanding channels of national waste."

These vested interests really work as internal enemies of the movement and are more dangerous and parasitic than the enemies from the outside. Vested interests often use these practices to have a strong hold over the movement, (i) put restriction on fresh membership ; (ii) avoid holding of general meetings and often delay them ; (iii) manipulate in election of office bearers ; (iv) employ near

relations and acquaintances in the paid service of the society; (v) grant them loans liberally; (vi) do not take any action against them in case of late repayment of loans; and (vii) general use of the machinery of the society for personal use.

10. Unplanned and Hurried Expansion

The quality of the movement has suffered on account of rapid unplanned expansion of the societies by the State Cooperative Departments. It has been observed by a member of the Planning Commission "That the tragedy has been that the Ministry and Planning Commission were so obsessed by targets for the number of societies to be opened that they did not seem to be aware that quite a large proportion of the societies were either still born or ceased to show any sign of activity." This hurried expansion led to a high early mortality and a large number of dormant societies. *The Mirdha Committee on Cooperation* has said, "The shortcomings and defects that are observed in the movement are an outcome of a deliberately accelerated pace of expansion." To earn credit for them, the officials tried their best to open as many new societies as could be possible and for this they give very rosy picture to the cultivators to join these without explaining them the difficulties that may develop in future. When high hopes for the liberal grant of loans and subsidies could not be fulfilled, a large number of societies became moribund.

11. Lack of Dedicated Leadership

Unlike in countries like U. K., Germany, Sweden and Italy, the movement in India has not been able to secure the services of selfless, devoted and honest leaders with missionary zeal. *The Rural Credit Review Committee* (1969) has remarked, "Barring exceptions, the movement has, by and large, failed to throw up competent leadership on a scale commensurate with the considerable expansion that has taken place in its operations. Various field investigations provide instances of cooperatives, continuing to be dominated by moneylenders and others who use funds of the societies to promote their own ends, financial or political." In fact, *there has been an inadequate development of non-official leadership*. It lacks competence, knowledge, integrity, efficiency and a sense of dedication.

12. Fragmentary Approach

Lasting good can come to the members of the cooperative societies only when their problem is visualised as a whole and directing the cooperative attack simultaneously upon as many fronts as possible. Unfortunately, in India, the problem has been treated in isolation. Dr. Gyan Chand has said, "The isolation in which the various activities have been cooperatized has been self defeating and these activities have been gravely hampered in realisation of the potential'."

13. Lack of Congenial Atmosphere

The success of rural cooperatives pre-supposes a modicum of social equality, political democracy, and economic viability among the villagers. Unfortunately these conditions have not been present in the country. In India, the producer, being the member of the co-operative, has to face competition with private traders and money lenders. Besides, there is also to be found a cleavage of interests in the village itself. Village leadership usually operates partly for the advantage of the more powerful economic interests and partly in alignment with the social institution of caste. This leadership makes itself felt in cooperative society. The *Rural Credit Survey Committee* has said, "The socio-economic background of Indian village especially the areas with long-standing feudal traditions, is not conducive to the functioning of an institution based on democratic and egalitarian principles." The *Rural Credit Review Committee* observed. "The sociological soil in India today is more favourable to corruption and oppression than to cooperation and planning." This is proved by the fact that money lenders and influential members even now exert a great influence on the village life and have thwarted the work of credit societies, bringing bad name to the movement.

14. Lack of Supervision, Audit and Inspection

It has been the experience of many expert committees that many societies are neither properly audited nor effectively supervised. The reason is that the auditors and supervisors are heavily over-burdened with routine work and they do not find time to supervise the work of the societies. Besides, lack of adequate and competent staff, absence of unitary control over the supervisory staff and lack of co-ordination among extension officers, bank inspectors and inspectors of cooperative department have also acted as inhibiting factors in making supervision effective.

Because of ineffective supervision a number of abuses arise in the working of the movement. As pointed out by the Rural Credit Review Committee, "From non-existent or ineffective supervision arise many other weaknesses which also lead to overdues, such as book adjustments of debts, bogus loans, mis-utilization of credit and the failure to take steps to recover."

15. Inconsistency in Policies and their Half-Hearted Implementation

This factor has also hindered the development of the co-operative movement. Policies have been changing frequently and even the accepted policies have not been implemented seriously. This has left a wide gap between what should be and what actually there has been. The decisions taken at the State level do not take into confidence the field level workers and the officials, therefore, feel that policies have been thrust on them. Even there is no coordination between the centre and the States in regard to implementation of the policies.

In brief, it may be observed that:

(1) The co-operatives in different sectors function more or less in isolation and do not lend sufficient support to one another.

(2) Except in the sphere of credit, the principle of federalism has not been significantly developed within the respective sectors themselves. There has been inadequate linking of credit with supplies, services, thrift and marketing, the overdues problem etc. .

(3) The initiative still comes from the government and not from the people. The dynamism that is associated with the term movement is still lacking to an appreciable degree.

(4) Primary societies concern themselves only with credit. The area of operation is either too small to enable the society to be viable, or too big to ensure mutual knowledge and social cohesion.

(5) A right adherence to principles of unlimited liability has kept some of the solvent farmers from such societies.

(6) There has been a lack of coordination on the part of the central bank with the societies on the one hand and apex bank on the other.

(7) The general lack of education and the inadequacy of training in commercial banking methods is one of the important causes of the unsatisfactory record of cooperation in India.

FUTURE OF COOPERATIVE MOVEMENT

Cooperation has shown its effectiveness in various fields like removal of poverty by reducing members' indebtedness, lowering interest rates, consolidation of holdings, increasing productiveness and thrift, lowering of the cost of necessities to members, provision and disposal of their produce and discouraging unnecessary social expenditure, it has done something to raise the standard of living, it has increased the country's banking facilities, it has given the people hope. In all these directions and in others cooperation has made more or less progress although it has so far admittedly affected only a fringe of the situation.

The *Gadgil Committee* (1945) remarked "that, the spread of cooperation (deserves serious attention) for it would provide that best and the most lasting solution for the problem of agricultural credit in particular and those of the rural economy in general." About ten years later, the *Rural Credit Survey Committee* after an exhaustive study of rural credit in India came to the conclusion that, "Cooperation has failed, but cooperation must succeed." It is, therefore, necessary that future objective of policy should be to create conditions in which cooperative credit will have a reasonable chance of survival.

The urgent need is to provide cheap credit at reasonable rates and to improve the economic conditions of the farmers. The former

involves consolidation of holdings, improvement of his land (by irrigation or otherwise), the improving of his methods of cultivation, encouraging the pursuit of one or more supplementary occupations, or enabling more profitable disposal of his produce through co-operative marketing and processing societies. The reduction of expenditure involves sound systems of land holdings and land revenue assessment, the availability of required supplies as well as credit at reasonable rates, the reduction of unnecessary expenditure on social ceremonies by a reform of public opinion, the encouragement of thrift in the form of saving accounts or insurance and especially education, which will not only facilitate most of the foregoing objects, but will also help to safeguard the cultivators against exploitation.

Movement has Potentialities for Future Development

It may be noted that if the movement has not achieved the desired degree of success, it is not because the principles of cooperation are unsound, but because these have not been faithfully followed in the country. Needless to say that the movement has great potentialities and it can rightly provide solutions to man of the economic evils. Dr. Gyan Chand has said, "Cooperation, if adhered to in practice in letter and spirit, can be very fruitful, provided the preconditions of its realisation receive their due consideration, and the forces, which in effect are working for negation of cooperation, are held in check and are not permitted to defeat its object."

Other Commissions and Committees have also expressed their faith in the movement. The *Royal Commission on Agriculture* concluded that "if rural community is to be contented, happy and prosperous, local governments must regard the cooperative movement as deserving all the encouragement which it lies within their power to give."

The *Indian Central Banking Enquiry Committee* (1931) stated, "the cooperative movement in spite of imperfections and of unavoidable set-backs deserves every possible assistance from all quarters because there is no better instrument for raising the level of the agriculturist of this country than the cooperative effort, and a strong appeal to the banking interests of the country to assist this movement seems not at all out of place."

The *Reserve Bank of India* in its Review (1930-40) remarked, "the very travail of the movement served to reveal that no better alternative was possible. The movement for rural reconstruction can achieve real and durable results only with the cooperative ideal, and with a cooperative form and organisation."

Thus, it may be said that if a reasonable amount of help, sympathy and guidance is given, the movement can be rehabilitated and be made available for the alleviating of the ills of the rural population in the countryside.

Suggestions for Improvement of the Movement

At the very outset it may be noted that in the words of Sir Horace Plunkett, "Cooperative movement will succeed only as an integrated part of a comprehensive agricultural policy." This means that if lasting good is to be brought to the beneficiaries of the movement, it must visualise their problems as a whole and cooperative attack should be directed simultaneously upon as many fronts as possible. In future, therefore, cooperation should attempt to tackle the problem of agricultural improvement "as a whole" and not only provide cheap credit, but should also help the farmer to raise his income, reduce his expenses and improve his standard of living.

Condition Needed for Success

Let us now see how improvements may be brought about for successful working of the movement. In making suggestions for future cooperative development certain pre-conditions must be assumed, such as :

(i) It presupposes the existence of savings and thrift, which condition is still absent among the cultivators.

(ii) It must be based on the ordered will of the people. The movement cannot succeed unless the members are educated. Masses are yet illiterate and ignorant.

(iii) The success of the movement depends in a large measure on the judicious selection of members and the steps taken to educate them in cooperative principles. Unfortunately, people have been entrusted with management before they were fit for it.

(iv) It assumes integration in the movement, that is cooperation should be fitted into a coordinated effort to improve the condition of the masses. This has fortunately been achieved now.

(v) It presupposes for its success spontaneity of demand and initiative on the part of the people and some readiness to adopt its principles. But such things are yet lacking in India.

(vi) Frankness in propaganda and thoroughness in cooperative education are other important factors for success, i.e., all workers in the movement need be educated, and be imbued with the cooperative ideals.

(vii) Sound banking and business practices are indispensable to success on the part of the departmental and non official workers.

(viii) Loyalty and high moral of the members is another factor for success. "Without moral change, cooperation is open to the attritions, diversions and dissipations resulting from the impulses it seeks to supplant, acquisitiveness and worldly self-seeking"

MEASURES FOR FUTURE DEVELOPMENT

1. Official Control Should be Slackened

In order to popularise the cooperative movement and to promote a sense of responsibility among the members of the society, it is necessary that *official control* (that now exists) *should be slackened*. In the words of late Prof. H.L. Kaji, "The popular movement should be handed back to the people...the continuance of the control at every turn is detrimental to the highest interests of the movement." The Government's role should be to retain a thorough supervision and educate the members in the principles and methods of cooperation so that ultimately it may be handed to the people.

2. Cooperative Education and Training

To ensure efficiency in service, the paid staff in the movement should be adequately trained for the jobs, and the members and other office bearers should be taught the theory and practice of cooperation. In the absence of this, lasting improvements in social and agricultural conditions of the country cannot be brought about ; and what is more, in the words of Dr. R.K. Mukherjee, "the co-operative movement may keep alive an exotic plant, but will never thrive."

The *All India Rural Credit Review Committee* has recommended that cooperative leadership at all levels has to be educated on the need, from the point of view of efficient operation of cooperative institutions, for a clear demarcation of the respective responsibilities between the elected Board of Management and the paid executives and other managerial personnel and the related need for the latter to be given a degree of autonomy to take various individual decisions in conformity with broad principles laid down by the Board.

3. Recovery of Overdues

For smooth working of the cooperative system it is necessary that repayments should be regular, otherwise, "cooperation will remain both financially and educationally an illusion." It is, therefore, suggested that ; (i) loans for current agricultural and consumption needs should be repayable at the end of the agricultural season each year, (ii) loans for intermediate period for productive purposes should ordinarily be paid within three years. No relaxation should be shown to the persistent and wilful defaulters and legal action should be taken against them. Further extension may be allowed to erable members to tide over the temporary difficulties. More sound supervision by the central financing agencies may help in reducing overdues.

4. Reorientation of Loan Policies and Procedures

Cooperative finance to be useful should be so planned as to be available to each and every member and when actually needed by him. This should comprise the following measures : (i) The borrowing power and limit of each member and for each society should

be fixed each year : (ii) Societies with sound management should be allowed cash credit arrangement with their financing institution ; (iii) Societies of good standing may be permitted to keep some cash in hand which may be used for making small loans without approaching the financing agency ; (iv) procedural formalities should be kept to the minimum taking into consideration that more credit is not provided than needed and that funds are used for productive purposes ; (v) Crop loan system should be introduced in areas where this has not already been done and to implement it in all its aspects wherever it has been introduced partially.

5. Consolidation, Reorganisation and Revitalisation

Till recently, the emphasis in the cooperative sector has been on expansion. The present need is that more attention should be given to the consolidation of societies. Viable units should be promoted and all dormant, stagnant and feeble societies, which can be revived, should be liquidated or amalgamated with the stronger societies. This reorganisation of the societies will strengthen their resources and ensure viability by enlarging the area of operation, and reduce their chronic dependence on official subsidies and on borrowings from other financing agencies. Organisation of new societies should be kept to the minimum. The policy should be "one village, one society." *Secondly*, small society should be merged to organise larger societies, *Thirdly*, instead of single purpose societies, multi-purpose societies need to be organised.

6. Elimination of Vested Interests

In order to develop the movement on sound lines it is necessary that proper steps should be taken to curb the growth of vested interests in the movement. In this connection recommendations of the Conference of Chief Ministers at Madras (in 1968) deserve mention : (i) moneylenders, traders and other middlemen should be excluded from membership by law ; (ii) primary societies should have open memberships ; and (iii) seats on the Board of Management should be reserved for smaller farmers and members of the weaker sections.

7. Creation of Strong and Dedicated Leadership

The leader of the movement should be honest, dedicated and unselfish so that the movement could be taken "from the morass into which it has remained bogged for a long time." According to Shri S. K. Dey, "The ivory tower leadership should be a banned commodity." The *V. L. Mehta Committee on Cooperative Credit* has rightly said, "it will be necessary to draw in, for the management of cooperative institutions, public spirited workers who will subordinate their personal interests and party and political considerations to the common good of the people."

8. Mobilizing of Savings

Thrift and credit societies be restored and vigorous efforts should be made to raise the funds from rural masses in the form of deposits, to promote thrift and savings. The *All India Rural Credit Review Committee* has said, "The expanding area and scale of cooperative activity and its growing diversification have also made it necessary that cooperative banks should build up larger resources by way of deposits." This they may do by opening adequate number of branches ; adopting rational policy regarding interest rates and providing special incentives and services to depositors. In fact, according to Shri H. Calvert, "no panacea for the trouble of Indian poverty will be of any lasting values unless there is thrift first. The great wealth of England is largely due to centuries of thrift ; the poverty of India's masses is largely due to its absence in the past."

^ Cooperative Movement should Deal with the Whole Life of the Villagers

Cooperation has to be expressed and developed as an organic whole. It should not satisfy one need but should also bring organisational unity and should prove a living centre around which the whole life of the villagers move. The *Fourth Plan* has observed, "It is only when cooperative organisation embraces all activities from production, through credit sale, supply, processing and storage to consumer stores and act as an integrated system that they can fully discharge their social and economic responsibilities." Thus (i) a village credit society should take up the whole life of the village within its fold : (ii) it should aim at including every one in the village : (iii) it should have constant dealing and maintain continuous touch with its members ; and (iv) it should try to adhere more to cooperative principles. To attain these objectives, the present functions of a village credit society should be enlarged.

For economically backward areas, for areas largely inhabited by backward tribes and for economically backward occupational classes when special schemes of government for their benefit are in operation, the State should take special responsibility and provide administrative, technical and financial assistance, including subsidies, guarantees etc. where necessary to the cooperative societies and the Central Banks or branches of State Cooperative Banks which, in the aspect of credit are participants in the programme of special development.

10. Efficient Management

Efficient management of the sizable business of the cooperatives need a high degree of professional competence. This can be achieved only through formation of common cadres. Immediate steps should be taken for implementation of the common cadre scheme. Services of trained administrators and devoted workers should be enlisted. Adequate arrangements should be made for provision of such personnel.

In brief, the reduction of overdues, mobilization of deposits, revitalisation of dormant societies, amalgamation of weaker ones into viable units, introduction of crop loan system, effective linking of credit with marketing and improving the over-all efficiency of cooperatives by toning up their management and better supervision of the use of loans at all levels are the most important aspects of future cooperative policy. If these are accomplished, cooperative societies and cooperative banks may cease to be mere groups of borrowers as at present and emerge as an effective banking agency and serve the cause of agricultural production better than at present.

GOVERNMENT AID TO CO-OPERATION

Government Assistance Why?

In Western countries, the cooperative movement developed spontaneously and was a movement of the weak against the strong, but in the developing countries like India, it has been born, nurtured and brought up by the Government "not because it was desired but because it was desirable to do so for the peculiar conditions that prevailed in the country during the last quarter of the 19th and the early 20th century." The main feature was that unlike the Western countries, India had no suitable agency to take the initiative. Further, the people being self-sufficient under the village economy did not think of combining themselves formally to undertake jointly the activities of common interest, though examples of cooperating with each other in times of need and during agricultural seasons was not conspicuous by its absence, as in the work of sowing, harvesting and irrigating the land. The money needed for agricultural and social operations was borrowed from the village money-lender, of course at a high rate of interest, to whom the borrower was often tied, merely as a slave for the life-time. This made the economic conditions of the rural people rather miserable. This condition followed by other factors led to the Government association with the development of cooperative movement in the country initially. These other factors were :

(i) to provide legal protection to the cooperative societies once established, and to provide for proper arrangement for their management and supervision ; (ii) to look after the economic and other interests of the people associated with these societies ; (iii) to check misuse of privileges given to the cooperative societies ; (iv) to promote the movement on right lines so that leadership could be developed from within and new ideas and techniques could be diffused among the members. (v) to implement the rural and agricultural development programmes through the agency of these societies.

Is Government Assistance Desirable ?

With these objectives in view, the Government associated itself with the growth and development of the cooperative movement in

India. This is in agreement with the resolution of the F.A.O. in its technical meeting on cooperation for Asia in 1949, which runs like this : "The role of the Government in relation to cooperative societies should be one of active helpfulness intended to stimulate cooperative enterprise, to guide it and to keep it on sound lines without either attempting to compel or to replace local initiative and self-help. Government should, in addition, promote conditions under which cooperatives will thrive and develop".

The *Rural Credit Survey Committee* had also favoured State aid to cooperative movement, in various ways, to withstand opposition from vested interests. "The role of the State is to fill up the gap in the requirements of share capital, technical assistance, administration and organisation." It justified State aid in these words : "The prevailing conditions cannot be transformed by the very persons who are oppressed and rendered weak by their existence. The forces of transformation have to be at least as powerful as those which are sought to be counteracted. Such force can be generated not by cooperation alone but by the cooperation in conjunction with the State."

Accordingly, the Government both the Central and the State, chalked out programmes for aiding the cooperative movement. These included : "Legislative reforms such as modification of tenure, tenancy rents, in the direction of enough incentives for better production, reconstruction of farms by consolidation of holdings into better managed cultivation unit or by cooperative farming, developing large facilities for irrigation, the supply of better seeds and manure, imparting of more and efficient technology, better use by the cultivator not only of his farm but also of his time, i.e., the provisions of subsidiary occupations to the cultivators." All these required planned initiative of the State as well as adequate finances.

Government assistance is welcome on the following grounds :

(a) Since rate of savings of the rural people is low the societies cannot sustain through financial hardship because of the low resources at their disposal. Hence, government assistance in various forms is welcome.

(b) Regulations of the activities of the societies are a must, otherwise the privileges granted to the societies may be misused and the funds misappropriated.

(c) Safeguarding the weaker sections from exploitation so that vicious circle of poverty, illiteracy, ignorance, and conservatism may be broken, and the people made enlightened.

(d) Stabilization of prices and distribution of commodities need that cooperation should assume the role of a balancing factor in the rural economy.

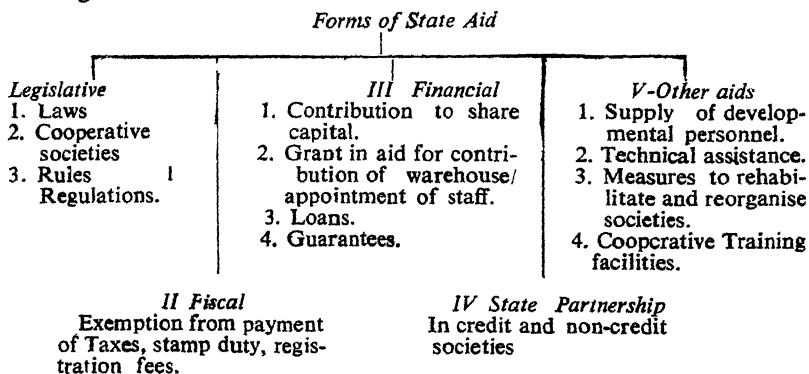
It may, thus, be said that State assistance is necessary but it should not be direct or addictive, and should not lead to a rigid

control and administration of the society by the government. It has been rightly observed that "cooperative organisation deserves assistance and encouragement from the State but it should become self reliant. It should not, in any case, be absorbed by the State. It should cover a wide section of the field of economic activity and in its turn should help the State to carry out some of its economic policies but it should maintain its own power and initiative, individuality and independence."

That State aid is salutary for cooperative movement has now been widely admitted and that aid, shorn of any undue control, cannot be objected to in a country like India.

Forms of State Assistance

State aid may assume many forms, as would be clear from the chart given below :



(i) Legislative Aid

Laws, Cooperative Societies Acts and Rules with their amendments have been enacted from time to time to suit the requirements of the States e.g.,:

(i) The Cooperative Credit Societies Act, 1904, was enacted on the model of the Friendly Society Act of 1793 of Great Britain.

(ii) The Act was amended in 1912, on the basis of British Industrial and Provincial Societies Act, to do away with the distinction between rural and urban credit societies.

(iii) Cooperation was made a State subject in 1919 and accordingly, the first State legislation began with the passage of the Bombay Cooperative Societies Act of 1925.

(iv) Nearly all States have since then passed their own Cooperative Societies Act.

(v) The Committee on Cooperative Law was set up in 1957, which framed a Model Bill, Rules and Bye-laws for the states.

These have subsequently been adopted by the States with slight modifications to suit their conditions.

(vi) Most of the State laws contain provisions regarding (a) the registration of societies, settlement of disputes, supervision of managing committees, authorities to hear appeals, amalgamation and dissolution of societies, prompt execution of awards and orders ; (b) state-aid, audit, inspection and supervision, nomination of directors by Government, compulsory amendments of bye-laws ; (c) exclusion of vested interests in the cooperative movement ; (d) reservation or representation of small farmer and members of the weaker sections on the Board of Management, restrictions on holding of office for more than two terms in the same institution and also simultaneously in more than two institutions, regulation of loans issued to the office-bearers ; (e) rules for requirement of staff ; (f) education and training of staff, creation of cadres of trained managerial personnel and for auditing by the department.

(vii) Certain laws, like Agricultural Debtors' Relief Act, and Moneylenders' Act, though not meant to be helpful directly to the cooperative movement, have turned indirectly beneficial for the movement by freeing the cultivators from the clutches of the money lenders, and by placing moratorium on the loans. Further, legislative action has been taken in 10 States and 6 union Territories for removal of rural indebtedness, *i. e.*, moratorium, liquidation and scaling down of debts, in 1977.

Two facts may, however, be noted : One, the Central Government has no direct power over cooperatives. Second, very few laws on the national level are applicable to cooperatives in the whole of the country.

(ii) Fiscal Assistance

Special concessions and privileges are given by the State to the cooperative societies such as :

(i) Exemption from registration fee for transactions relating to shares and debentures and the court fees ;

(ii) Exemption from payment of stamp duty in respect of instruments executed by the cooperatives relating to their business ;

(iii) Exemption from payment of tax, super-tax on profits of a society or on dividends paid out of profits ;

(iv) Exemption from any other State tax or fee or duty payable by or on behalf of a society ;

(v) Deductions from income-tax, the entire income earned by the cooperatives in the form of interest or dividends from investments with any other cooperative society or any income derived from the hiring of godowns, warehouses for storage, processing or facilitating the marketing of products.

(vi) Exemption from attachment of shares of cooperative societies.

(vii) Free or concessional remittance and transfer facilities to the cooperative societies: and

(viii) Provision of contracts for public works, land and building and stores for cooperatives at concessional prices : and consultative services.

(iii) Financial Assistance

Financial aid is given in the shape of maintenance of the cooperative department; loans and grants-in-aid to cooperative societies : subsidies and grants to cooperatives, help in raising long and short term loans.

(i) The State Governments maintain Cooperative Department under the charge of the Ministers and the Registrar of Cooperative Societies is the important authority. The Department is maintained, out of the special allotments made in the State budgets, for administrative purposes. The Registrar is the *Brahma* (The creator), *Vishnu* (The preserver) and *Maresh* (The destroyer) of the cooperatives. He occupies the central position in the administrative set-up of the Department with rights to receive, enquire and register applications for registration, to register bye-laws of the societies and their amendments, to audit the accounts, to evaluate, the assets and liabilities to make inspection, execution of decrees and awards, abridgement of disputes and liquidation. *He is in a way a friend, philosopher and a guide for the movement.*

The Department provides: (i) necessary assistance and guidance in time to the societies to enable them to work satisfactorily and efficiently. (ii) help in designing a framework in which the society can function successfully, without impairing the cooperative character and the requirements of a sound business: (iii) a liaison with all external agencies. The departments maintain technical and other staff for administering, inspecting and supervising different types of societies working in the state.

Personnel are supplied either entirely or partly free of charge to various cooperative departments by the State and help given for imparting education and training in cooperation.

(ii) Loans are given, especially to large-sized societies and marketing societies (as in the Maharashtra) to lift irrigation societies; to housing societies (as in Tamil Nadu) : to sugar cooperatives (as in U.P.) and to other agricultural non-credit societies for construction of godowns, irrigation channels, housing colonies etc. Funds of these are provided out of the plan resources and are channelled through the National Cooperative Development Corporation.

Loans are provided to cooperative credit institutions for certain development programmes especially those for which loans are not available from regular financing agencies, for example, the state governments provide loans for routing *Takavi* loans through co-operatives.

The State Governments also help the cooperative institutions to raise both long-term and short-term loans through their guarantee for the debentures floated by the Central Land Development Banks as regards the repayment of the principal and interest on loans. The Government extend their guarantee in respect of loans taken from Central Banks and the S.B.I. The State Governments also give guarantee for the medium-term loans sanctioned by the R.B.I. to the State Cooperative Banks. The guarantee given by the States, for various purposes, creates confidence in lending institutions, provides strength to the borrowing cooperatives; and sees that loans advanced are properly utilized for the purpose for which they are taken.

The Central Cooperative Banks which are very weak and whose bad and doubtful debts, accumulated losses and other overdues over 3 years exceed 50% of their owned funds are less than Rs 50 lakhs are given central support under the Centrally Sponsored Scheme.

The cooperative banks in cooperatively weak States are given assistance to enable them to overcome the difficulties in providing the non-over due cover.

Central assistance is also given to the Apex Cooperative Banks for building up their Agricultural Credit Stabilization Fund to be used for granting conversion of short-term loans to medium-term loans in areas affected by natural calamities.

(iii) **Subsidies and Grants are provided to the cooperatives** by the State Government, for educational activities, supervision of societies, for meeting of losses incurred by the societies like those of the forest labourers and the labour contract societies.

Subsidies are also given to agricultural credit societies for construction of godowns and meeting managerial cost of credit, appointment of additional staff to central and Apex banks, Managerial subsidies are given for a period of 3 to 5 years on a sliding scale. Marketing and processing societies are given subsidies for maintaining proper staff, hiring and construction of godowns. The State Governments receive funds from the Central Government through N. C. D. C. Long term loans are given out of the National Agricultural Credit (Long term operations) Fund of the R. B. I.

Subsidies are also given to the Central Land Development Banks (as in Maharashtra) for making loans for digging of wells and construction of bunds, and for dairy and poultry development through Agricultural Refinance Development Corporation.

Financial assistance is also provided to the cooperative credit societies for enabling them to build special bad debt funds for meeting credit requirements of the weaker sections. The Government provides incentives to the cooperatives so that they may liberalise their lending policies and increasingly meet the credit requirements of the marginal and sub-marginal cultivators.

(iv) **State Partnership.** Under the recommendations of the All India Rural Credit Survey Committee, State partnership in share capital of societies at all levels has been in vogue. The aim of the capital resources and the borrowing power of the societies so that ultimately each society may progressively increase its own capital and after the capital resources of the society reaches an optimum level, the government capital may retire.

The State Governments, thus, contribute towards the shared capital of the cooperative institutes, viz., primary credit societies, central cooperative banks, marketing and processing cooperatives. State partnership has also been increasingly provided in case of other societies too such as cooperative farming societies, labour contract/construction societies, dairy cooperatives, fishery cooperatives and transport cooperatives.

(v) **Other Assistance** (i) The State makes arrangements for education and training of official and non-official personnel. The programme of *Education and Training* is looked after by the National Council for Cooperative Training established in 1976, with the entire finance from the Central Government.

(a) **Senior level personnel**, departmental and institutional, of the cooperative sector are trained at the V. L. Mehta National Institute of Cooperative Management at Pune and the Cooperative Bankers Training College of the R. B. I. at Pune. Short-term courses, refresher courses and conferences, seminars and workshops are conducted here. Besides Research is also carried on selected aspects of cooperative movement ; and preparation of case studies and case materials.

(b) **Intermediate level personnel** are trained at 16 regional cooperative training centres-working at Madras, Patna, Ranchi, Poona, Kalyani, Kota, Indore, Vallabh Vidhyanagar (Anand) Meerut, Bhubaneswar, Hyderabad, Bangalore and Gopalpur-on Sea. At these centres are conducted courses relating to cooperative marketing, Cooperative audit, industrial cooperation, land development banking, cooperative banking, grading, storage and warehousing and cooperative management.

(c) **Junior level or subordinate employees** of the cooperative departments and institutions are given training at the cooperative training centres which number 69. These provide short term special sectoral courses.

The National Cooperative Union of India (1957) has also taken certain other measures too like : (i) organising a cooperative congress (every 2 or 3 years) in which discussions are held on cooperative policies and programmes, (ii) holding seminars at national, state, regional/district levels to enlighten non-official leadership : (iii) organising state tours for providing practical guidance to non-official leaders : and (iv) sponsoring deputation of prominent non-official leaders to study the working of cooperative movement in foreign countries.

The NCUI published two Journals namely the *Indian Cooperative Review* (a quarterly) and *Cooperative* (a fortnightly).

(ii) Various measures have been taken by different State Governments to rehabilitate and reorganise the cooperative movement. This has led the Central Government to appoint Expert committees, Study Groups and Commissions to review, suggest, and report on the problems referred to them.

Some of these are :

S. No.	Committee	Purpose
1	2	3
(1) All India Rural Credit Survey Committee 1951, appointed by the R. B. I. under the chairmanship of Shri A. D. Gorwala. Reported in 1954.		To plan, organise and supervise a survey regarding facilities available in rural areas for providing agricultural credit to the agriculturists and to make necessary recommendations. To go in to the various aspects of cooperative credit.
(2) Committee on cooperative credit, appointed in 1959 by the Govt. of India under the chairmanship of Shri V. L. Mehta. Report submitted in 1960.		
(3) Committee on Cooperative Law (1956) was appointed by the Govt. of India under the chairmanship of Shri S. T. Raja-- Reported in 1957.		(i) To review the existing cooperative legislation and to make recommendations for a simple legislative measure to facilitate coordinated development : (ii) To examine the modification necessary in the cooperative societies Act, and rules so that State partnership in the share capital could be introduced : (iii) To examine the existing provision relating to various types of cooperative societies (iv) to prepare standard sets of bye-laws which would facilitate the proper and smooth working of new types of societies.
(4) Working Group on Cooperative Farming was appointed by the Govt. of India under the chairmanship of Shri Nijalingappa in June, 1959.		To study the working cooperative farming societies and to suggest ways of making them more effective.
(5) Working Group on Panchayats and Cooperatives was appointed by the Govt. of India in 1961 under the chairmanship of Balwant Rai Mehta,		To study and suggest measures to achieve maximum coordination between the cooperatives and panchayats which have both a close ideological link and aim

1	2	3
		to democratic decentralisation.
(6)	Study Team on Cooperative Training was appointed by the Govt. of India in 1960 under the Chairmanship of Shri S. D. Mishra.—It reported in 1961.	To study the existing arrangements for cooperative education and training and to suggest measures for making the arrangements commensurate with the requirements of cooperative training during the Third Plan.
(7)	Committee on Consumers' Cooperation was constituted by the National Cooperative Development and warehousing Board in 1960—It reported in 1961.	To examine the promotional and organisational aspects of the consumers' movement for ensuring sound and speedy development thereof.
(8)	Committee on Tacavi Loans was appointed by the Ministry of Community Development and Cooperation, in July, under the Chairmanship of Shri B. P. Patel. It reported in August, 1962.	To examine the existing arrangements for the supply of tacavi loans to farmers and suggest measures as will ensure effective implementation of the policy of routing tacavi loans through co-operatives.
(9.)	Working Group on Industrial Cooperatives was appointed by the Ministry of Commerce and Industry in September 1962—It reported in May, 1963.	To review the position of the existing industrial cooperatives and to recommend special programmes for their promotion and development during the Third Plan.
(10)	The study Group on Cooperatives under railways was set up by the Ministry of Community Development and Cooperation in 1962. It reported in April, 1963.	To assess the working of cooperatives organised in the railways, and post and telegraph department and to suggest measures for the promotion and development of such cooperatives during the Third Plan and after.
(11.)	Committee on Cooperative Administration was set up in April 1963, under the chairmanship of Shri V. L. Mehta. It reported in 1964.	To review the existing departmental set up for the states and to suggest measures for their strengthening and for improvement in their working.
(12.)	Study Group on Urban Credit was appointed in May 1963.	To study and report about the existing situation and suggest improvements in the working of urban credit societies.
(13.)	Study Group on Transport cooperative was set up in September, 1962 by the Union Ministry of Transport under the	To examine the scope of transport cooperatives, draw up a pattern of organisation for such societies, assess their

Chairmanship of Shri S. N. Bilgrami. It reported in May, 1964

(14.) Working Group on Housing Co-operatives was appointed in 1963. It reported in 1964.

(15.) Committee on Cooperative Marketing was appointed in 1964 under the chairmanship of Dr. M. L. Dantwala. It reported in 1964.

(16.) Mirdha Committee on Cooperation was appointed in 1964 under the chairmanship of Shri R. N. Mirdha. It reported in August 1965.

(17.) Committee of direction under the chairmanship of Prof. D. R. Gadgil was appointed by the Ministry of Cooperation in 1964. It reported in Sept., 1965.

(18.) All India Rural Credit Review Committee was setup under the Chairmanship of Shri B. Venkatappiah in 1968. It reported in 1969.

financial requirements and suggest pattern of financial assistance.

To examine the scope for the organisation of cooperative housing societies and to suggest their future pattern.

To review the present pattern of cooperative marketing of agricultural produce, distribution of production inputs and supply of consumer goods at various levels and indicate the future pattern of development with particular reference to mutual relationship and coordination between various organisations at different levels and to indicate the role of cooperative marketing in an integrated structure of credit, supply and processing and to suggest how best this role can be fulfilled.

To lay down standards and criteria for judging the genuineness of cooperative societies and to suggest measures for weeding out nongenuine societies and vested interests : and to review the existing cooperative laws, rules and practices with a view to locating the loopholes which enable vested interests to entrench themselves in cooperative institutions.

To evaluate the progress in pilot projects and devise methods, techniques and organisational set up for the cooperative farms.

To suggest measures for reorganisation of rural credit in Reserve Bank involving the establishment of an Agricultural Credit Board : setting up a Small Farmers Development Agency (SFDA) in each of the selected districts : creation of Rural Electrification Corporation ; formulation of a more active and much bigger role for the Agricultural Refinance Corporation etc.

Some other Committees are :

- (1) The *Debenture Norms Committee* of the R.B.I. to suggest norms of recovery on a uniform basis for all lending programmes of the Land Development Banks.
- (2) **The Committee on Cooperative Land Development Banks** to suggest measures for improving the loaning policies and procedures.
- (3) **The Committee on Integration of Cooperative Credit Institutions** to recommend ways and means of integrating the two wings of the Cooperative Credit Structure at all levels, i.e. primary, intermediate (district) and the apex (State) in a phased manner.
- (4) **Expert Groups on Agricultural Credit schemes of Commercial Banks**, by R.B.I. in August 1977.
- (5) **Committee on Regional Rural Banks**, under Dr. M. L. Dantwala, 1977, to suggest measures for improvement in the working of these Banks.

Concluding Observations

From the foregoing analysis it may be said that the State has played an important part in starting the cooperative movement and in its organisation and development. "The State", in the opinion of the Rural Credit Survey Committee, "should not only aid and control the movement but also partner the movement at different stages, at the apex, the central and the primary level in order to provide the provincial and organisational strength necessary to compete successfully with private money-lenders and traders."

It may, however, be pointed out that from the beginning in 1904 to the present day, the cooperative movement in India has developed largely on state aid, and as Horace Plunkett has said, "cooperation has not been a 'movement' but 'policy' created by resolutions of the Central Government." This has been said so because, it has been the cooperative Department of the States which has not only performed the *legal functions* of registration, arbitration and dissolution of cooperatives and *regulatory functions* of enquiry, inspection and audit, but also performed the functions of promoting development, supervision, guidance and assistance.

However, State aid and assistance is essential not only for newly created cooperatives but also for the existing ones which suffer from inadequate finance, technical guidance and timely help from the officials of the cooperative department. Deofficialising the movement may only lead to more corruption and may also prove futile. So what is needed is that State aid should be available to the cooperatives but it should be withdrawn as soon as the cooperatives become economically viable.

State and Agricultural Policy

Historical Review of the Agricultural Policy

For a long time the policy of the British Government towards agriculture had been of apathy and drift. The East India Company was interested in commerce rather than agriculture. After the War of Independence (1857), when the Crown replaced the company, the main objective of the British policy was administrative consolidation rather than economic regeneration. A series of severe famines that occurred in India in the last quarter of 19th century roused the Government to the need of looking into the ills of Indian agriculture. The Famine Commissions of 1880, 1898 and 1902 and the Irrigation Commission of 1903 made constructive suggestions for the improvement of agriculture in India. But the Government policy was mainly confined to palliatives like the revenue remission, famine relief and takkavi loans.

The Famine Commission of 1880 opined that it was unfortunate that agriculture formed the sole occupation of the mass of population and pointed out, "No remedy for the present evils can be complete which does not include the introduction of diversity of occupations." The other proposals of the Commission were : "(i) The revival of the Department of Agriculture of the Government of India to be entrusted with the duty of collecting experience of past famines and of undertaking definite and permanent charge of administration of famine relief ; (ii) the simultaneous formation in all provinces of Departments of Agriculture with a large subordinate establishment working under each Director of Agriculture ; (iii) the distribution of loans to farmers by the Government on the security of land ; the appointment of special Courts to enquire into rural debts with a view to equitable reduction and payment by instalments." But as the Royal Commission on Agriculture puts it. "The Government of India took no immediate action on the proposals."¹

In 1889, Dr. J. A. Voelcker, (Consulting Chemist to the Royal Agricultural Society) was sent out by the Secretary of State for India

1. Report, *Op. Cit.*, pp. 17-18.

"to advise upon the best course to be adopted in order to apply the teachings of agricultural chemistry to Indian agriculture and to effect improvement in it." Dr. Voelcker toured in different parts of India till 1891 and recorded his views and conclusions in a Report entitled *Improvement of Indian Agriculture*. He held the view that the methods followed by the Indian agriculturists were not as backward as they were believed to be, and were best suited to the Indian conditions and to the different soils in India. He opined that the difference in agricultural conditions were due to three factors, viz., (i) "*differences inherent in the people themselves*" as cultivating classes, e.g., the fact that farmers from certain castes and races are not good at farming while those belonging to others are good cultivators ; (ii) "*differences arising from purely external surroundings*" such as : (a) natural causes like climate, soil, irrigational facilities, manure, grazing, and (b) economic or political conditions like the relative ease or difficulty of living, paucity or pressure of population, smallness of holdings, want of capital, defective land tenures ; and (iii) "*differences arising out of want of knowledge*," for instance, the existence of diversity of agricultural practices in different parts of the country.

He, however, emphasised that the systematic prosecution of agricultural enquiry and the spread of general and agricultural education among the peasants would go a long way to improve the lot of the Indian farmer. He recommended the adoption of certain measures which may be summarised as follows :

(a) The spread of general and agricultural education, and the preparation of suitable text-books in the vernacular for the purpose, (b) the extension of canals and other means of irrigation to tracts where they are required ; (c) the more energetic working and popularising of the system of *takkavi* advances for digging of wells and similar other purposes ; (d) the institution of Agricultural Departments to ascertain the irrigation requirements of each district ; (e) the creation of reserves of wood and fodder ; the planting of trees along canal banks and railway lines and the further encouragement of arboriculture ; (f) the continuation and extension of experimental research aided by chemical science in reference to new crops, methods of cultivation, manures, etc. ; (g) the trial of new implements at government experimental farms and the distribution of approved implements among the cultivators ; (h) the distribution of seeds and agricultural farms ; (i) the location of stud bulls at government farms and the encouragement of improved breeding of cattle.

Dr. Voelcker attended the Agriculture Conference of 1890 held in Simla which arrived at two noteworthy decisions. *Firstly*, that the scope for improvement in Indian agriculture was great enough to justify the establishment of a sound system of scientific investigation into the agricultural education. *Secondly*, that an expert was required for a scientific investigation. This led to the appointment of an Agricultural Chemist to the Government of India for conducting research into problems relating to agriculture. The need for develop-

ment in other directions was also felt soon. In 1901 an Inspector-General of Agriculture and a *Mycologist* and in 1903 an *Entomologist* were appointed. About this time Mr. Henry Phipps of Chicago offered a donation of Rs. 5,00,000 to Lord Curzon to be applied to some object of public utility preferably connected with scientific research. The donation was used for the establishment of the Pusa Research Institute. The post of the Inspector-General of Agriculture was abolished and it was replaced by the Director of Agricultural Research Institute at Pusa, who was also to act as the *Agricultural Adviser to the Government of India* till 1929. This Institute was established at Pusa (in Bihar) in 1903 with fully equipped laboratory, an experimental farm and a cattle farm. An agricultural college was attached to it in 1908 to serve as a model for the agricultural college in the provinces and to provide a course of advanced education.

The Central Research Institution at Pusa was expected (1) to prove a focus of agricultural research all over India ; (2) to serve as a model for a similar institute in other provinces ; (3) to initiate the programmes of agricultural research ; (4) to evolve better methods and better varieties of crops ; and (5) to pursue further promising experiments begun in any of the provinces.

In 1905 the need for an agency in each State to undertake agricultural research and to promote agricultural improvement by evolving improved varieties and methods suited to the conditions prevailing in India and popularising them had been clearly realised. The successive Famine Commissions since 1901 had pointed out the need for, and the possibilities of, agricultural improvement and recommended the strengthening of the research staff in the Agricultural Department in all provinces, and emphasised that "the steady application to agricultural problems of expert research was the crying necessity of the time." The result was a thorough reorganisation of the Agriculture Departments in 1905 in the Centre and the provinces.

An *All-India Board of Agriculture* was set up in 1905 in order to co-ordinate the activities of the State Departments. After the Reforms of 1919, agriculture became a transferred subject and since then it has been under the charge of a State Minister.

The Royal Commission on Agriculture

The Royal Commission (RCA) was appointed in 1926 to examine and report on the conditions of agricultural and rural economy in India and to make recommendation for the improvement of agriculture and the promotion of the welfare and prosperity of the rural population and in particular to investigate on :

"(a) the measures that were being taken for the promotion of agricultural and veterinary research, experiment, demonstration and education, for the compilation of agricultural statistics, for the

introduction of new and better crops and for improvement in agricultural practice, dairy farming and the breeding of stock.

(b) the methods of transport and marketing of agricultural produce and livestock,

(c) the methods by which agricultural operations were financed and credit afforded to agriculturists, and

(d) the main factors affecting the rural prosperity and welfare of the agricultural population and to make recommendations thereon."

The problem of land revenue and land tenure was excluded from the scope of the Commission's enquiry, although these were among the basic problems of Indian agriculture. The Commission issued a comprehensive Report in 1928. The recommendations of the Commission cover a very wide field including subjects like sub-division and fragmentation of holdings, improvement of livestock, irrigation, marketing, co-operation, agricultural finance, forestry, fisheries, villages development, communication, agricultural research, crop production, rural education and rural reconstruction. Generally speaking the aim of the recommendations has been to bring about greater efficiency throughout the whole field of agricultural production. In order to render the business of farming more profitable to the cultivator the Commission emphasised "the necessity of widening the outlook of the peasant and stressed the importance of government initiative in promoting agricultural progress." One of their basic suggestions was that *rural problem should be tackled as a whole in all its various aspects simultaneously*. A very important recommendation of the Royal Commission was the creation of the Indian Council of Agricultural Research (which was set up in 1929). The Commission also emphasised the urgency of widening the outlook of the cultivator himself so that he may become not only a better instrument of production but also a better man. It also defined clearly the responsibility of the Government and observed. "We have no hesitation in affirming that the responsibility for initiating the steps required to effect this improvement rests with the Government."

A major gap in the recommendations was that pressing problem of land ownership and tenancy were not covered as these were excluded from the purview of the R. C. A. These were no recommendations regarding the special needs of small farmers. Above all, the Provincial Departments of Agriculture remained unduly fettered in regard to financial matters by inelastic rules and regulations and the prevailing system of financing schemes.

The Economic Depression

Before much progress could be achieved in implementing the recommendation of the R. C. A., an economic depression of unprecedented magnitude set in (1929-33). It affected directly India's

export market for jute and indirectly the demand for other exports. The precipitous fall in prices hit the rural economy very hard. Hardly an action was taken by the Government either to arrest the fall in prices or to provide support to the economy with the result that agricultural indebtedness nearly doubled between 1929 and 1936.

Govt. of India Act, 1935

With the passage of the Government of India Act, 1935, the subject of agriculture, land, water supply, irrigation, forest, fisheries, public health and education were transferred to the Provincial government but curiously enough no adequate financial support was given for making substantial progress in the development work.

When Provincial autonomy came into force in 1937, some measure for the improvement of agriculture and conditions of peasantry, reduction in the burden of indebtedness and regulation of moneylending were undertaken. With a view to ensuring security of tenure and fair rent to tenant cultivators. Tenancy Acts were either passed or amended. Some steps were taken for consolidation of holdings, strengthening of the co-operative credit structure and create basic infrastructure for marketing of agricultural produce. With the enactment of the Agricultural Produce (Grading and Marketing), Act, 1936, progress was also made in grading and standardisation of agricultural produce. In 1936 was also appointed the Central Jute Committee for promoting cultivation and marketing of Jute. In 1938, the setting up of a National Planning Committee augured well for the future.

Russel and Wright's Enquiry

The Agriculture Commission had recommended that the work of Indian Council of Agricultural Research should be periodically reviewed by experts. Hence, in 1936 two experts, Sir John Russel and Dr. N. C. Wright were invited to conduct an enquiry. Sir Russel reviewed the Council's work in connection with crop production. He suggested some useful methods by which the results of research can be made more readily available to the cultivators. Other recommendations related to the methods for tackling insect-pests, dairy-farming, research scheme, the need for work on cash crops to be done in conjunction with nutrition experts. the establishment of better organisation for the distribution of seeds of improved varieties improvement of water supply for crops, including the establishment of a Central irrigation station, a soil conservation committee and a crop production committee to deal with the consideration of cropping schemes (on the lines adopted by the Crop Planning Conference, 1934), to arrange for working of control measures in relation to pests insects, etc.

Dr. Wright suggested measures in connection with the improvement of cattle and dairy industry. He emphasised the necessity of a

least doubling the output of milk annually. He recommended considerable reorganisation and development of research, education and advisory services. The recommendations included reconstitution of Bangalore Institute and Indian Dairy Research Institutes at more suitable centres, and extension of Anand Creamery, improvement in training for Indian dairy development and establishments of Provincial Advisory Services for dairy industry including the appointment of Dairy Development Officers in each State. He also advocated a greater use of experiment and demonstration farms so as to make them valuable nuclei for breeding and distributing the pedigree milking stock and proper centres for a study of mixed farming methods. An animal geneticist should deal with the problems of breeding and genetical research should receive more attention. He also laid proper emphasis on unification of livestock improvement and veterinary work under a single department of animal dairy husbandry in each province.

Second World War And After

The outbreak of the Second World War (1939-1946) dislocated the normal flow of goods—particularly the primary products to foreign countries. This adversely affected the interest of the farmers and the agricultural sector as a whole.

The Japanese occupation of Burma in 1942 and the consequent stoppage of import of rice from Burma completely upset the food strategy of the Government. There the government was compelled to make efforts to increase food production, and evolve a viable food policy to meet the scarcity conditions. The Grow More Food (G M F) campaign was launched in 1942 with a view to increasing agricultural production and improving agriculture, including diversion of acreage from cash crops, extension of irrigation and use of inputs. From the Bengal Famine of 1943, increasing responsibilities were evolved by the Government.

The Food Grains Policy Committee and the Famine Enquiry Commission, appointed during this period, not only endorsed the campaign but also gave suggestions for improving agriculture. In 1942, the Food Department was set up at the Centre. In 1945 the Department of Education Health and Lands was trifurcated to form a separate department of agriculture. With a view to speeding up land reclamation operations, the Central Tractor organisations, (CTO) was set up in 1946. During the same year, the Directorate of Plant Protection, Quarantine and Storage was also set up. In January 1946, an all-India policy on agriculture known as “statement of Agriculture and Food Policy in India” was declared. It said, “The all-India policy is to promote the welfare of the people and to secure a progressive improvement in their standard of living this includes the responsibilities of providing food for all, sufficient in quantity and of requisite quality. For the achievement of these objectives high priority will be given to measures for increasing food resources

of the country to the fullest extent and in particular to measured design to increase the output per acre and to diminish dependence on the vagaries of nature." The ten objectives of the Policy included : increase in production of foodgrains and protective foods ; improvement in methods of agricultural production and marketing ; stimulating production of raw materials for industry and exports ; securing remunerative prices for the producer and fair wages to agricultural labour ; ensuring fair distribution of food produced and promoting nutritional research and education.

Fair Commodity Committees were set up between 1944 and 1946 for sugarcane, tobacco, coconut and oilseeds. The Central Rice Research Institute was established at Cuttack in 1946 and 2 Research Institutes were set up for the study of the problems relating to inland and marine fisheries.

Independence And After

The advent of Independence in 1947 brought about a radical change in Government policy, aiming at solving the food problem and rationalising the agricultural economy. Experts like Lord Boyd Orr were invited to study and advise the Government. A number of river valley projects were started by the British Government which were later on included in the First Five Year Plan.

During 1950-51, the G. M. F. campaign was reoriented to give special attention to compact areas called "intensive cultivated areas" which possessed assured water supplies and good soils. Integrated production programme was launched in June 1950 to promote the production of cotton and Jute. In 1952, the G. M. F. Enquiry Committee was set up which opined that the "programme was not a spectacular success due to its inability of arousing popular enthusiasm." It suggested the setting up of a country-wide extension organisation. It also recommended acceleration of minor irrigation programmes, provision of adequate credit and quality seed and development of local manurial resources. Agrarian reforms were also undertaken, through passing of Zamindari Abolition and Land Reforms Act, 1951.

According to the Constitution of India, which came into force from January 26, 1950, agriculture, by and large, became a state subject. The Central responsibility in this area had been rather limited mainly to regulation and development of inter-state rivers and river valleys, fishing beyond territorial waters, institutions of national importance of scientific research and technical education. However, the amendment in 1954, relating to entry 33 in the constitutional Act has considerably widened the scope of action by the centre in agriculture.

Ford Foundation's Agricultural Production Team

The Ford Foundation Team of agricultural experts from U. K. and U. S. A., which visited India for a few weeks (during January

to April, 1959) made some very remarkable suggestions for solving the country's food problem such as :

(i) The Team opined that the target for the Third Plan should be to produce 110 million tons of foodgrains and that quantity would be required to make the country barely self-sufficient. It stated that "a 110 million tonnes target can be realised if an all-out emergency production is undertaken. Food production must be given top priority." It cautioned, "if India's food production increases no faster than the present rate, the gap between supply and the target will be 28 million tonnes in 1965-66. There will thus be a shortfall of about 25%. No conceivable programme of imports or rationing can meet the crisis of this magnitude."

(ii) The Team suggested that a portion of the funds available with the Government of India under P. L. 480 should be utilised "for the most effective use of abandoned rural un-employed and under-employed labour resources" for the production of foodgrains. The Team also suggested that some public work programmes (as bunding, terracing, surface drainage, minor irrigation, tanks, wells, etc.,) which may promote production of foodgrains be undertaken. These public work programmes, done through test relief or otherwise, should be directed to help agricultural production.

(iii) Since India is a large country with great diversity in climatic and other conditions, no blanket programme will fit all areas and, therefore, the problems of different areas (under different conditions) should be solved on their own basis. It also recommended the tailor-made approach for development of agriculture, i.e., the programme should be tailored to fit conditions prevailing in the area.

(iv) The Team stated, "the task before the country is to develop ways of raising the low average to higher level, that many Indian cultivators have achieved." To raise production per acre the Team recommended that "an all-out emergency food production programme should be undertaken." Besides, agricultural development must be given *the highest priority over all the categories of development* for the remainder of the Second Plan and for entire Third Plan.

(v) It is necessary to realise that in India, where cultivation is carried on by millions of small farmers "the prospects of adoption of improved methods of cultivation depend on prospect of an economic return to the agriculturist. This depends on assurance of stability of tenure, stable prices, and necessary marketing and credit facilities." The Team, therefore, recommended that "a cultivator should be considered to be creditworthy and entitled to credit if he is honest and repays his loan from production." If the peasant cannot give land as backing for his loan, even then, should be entitled to get the loan on the basis of the standing crop.

(vi) The Team also recommended that at all levels leadership should be provided and co-ordination achieved among planners, administrators, educationists, natural scientists, social scientists, local community leaders and cultivators.

(vii) The Team pointed out that Food Ministry should be treated with greater consideration than it has been practice so long. The National Development Council or the Planning Commission can surely lay down certain broad outlines but the administrative steps are to be taken by the Food Ministry.

"The effective implementation of a comprehensive programme of action which comes under the jurisdiction of several ministries, requires a far-reaching centralised authority with a clear line of command and execution. The Team believes that such an authority is essential to allocate resources on a priority basis, to co-ordinate irrigation, drainage and soil management programmes ; and to enforce policy divisions giving priority to food production."

National Commission on Agriculture

The N.C.L. was set up in 1970 "to examine the present conditions and progress of agriculture and rural economy, and to make recommendation for improvement, modernisation and the promotion of the welfare and prosperity of the people : and to report on the development of infrastructures including facilities for transport, marketing etc. and suggest lines of future development."

Among other things, the commission was required to investigate and report on : (1) the pattern of land use and nature of cropping thereon and the method of land development ; (2) the principles of development of water resources ; (3) utilisation of science in soil conservation and land shaping ; (4) implementation of land reform policy and changes needed therein ; (5) new strategy of agricultural development based on package of practices and modification needed to produce better results ; (6) forecast the requirements of fertilizers, seeds, pesticides, implements etc. for the decade ending 1980-81 ; (7) forecast of credit requirements for the decade ; (8) strategy of agricultural research, education, extension ; and (9) integrated development of agricultural, animal husbandry, and inland fisheries etc.

Till February 1975, the Commission has submitted 23 Interim reports on different subjects including fertilizer distribution ; seed multiplication ; some aspects of agricultural research, extension and training ; credit services for small and marginal farmers and agricultural labourers, reorientation of programmes from Marginal farmers and agricultural labourers Development Agencies ; modernising irrigation system and integrated development of command areas ; desert development ; production forestry ; whole village development programmes, sericulture ; social forestry, forest research and education ; certain important aspects of selected export-oriented agricul-

tural commodities ; agricultural price policies and certain important aspects of marketing and prices of cotton, jute, ground nut and Tobacco.

The Abridged Report and the final reports in 15 volumes was submitted to the Government of India. It is a comprehensive document for entire agricultural development.

MINISTRY OF AGRICULTURE AND RESEARCH

The Ministry of Agriculture was reorganised in 1964 with a "view to making it more effective and enabling it to be more active in matters of implementation of development schemes by the states." It attempted "(i) a re-distribution of subjects and responsibilities among the various units of the Ministry to make the assignments of the units compact and specific ; (ii) to assign scientific and technical officers of the ministry executive functions and operational responsibilities for planning, implementations and supervision of programmes in addition to their advisory functions to serve through better administrative machinery ; and (iii) closer and more continuous contact between the Central and State Governments in the implementations of agricultural plan schemes and to improve Centre-State relations."

The Head of the Ministry is the Minister of Food and Agriculture. The Ministry is divided into four departments, viz., the department of Agriculture, the department of Irrigation, the department of Rural development, etc. Formerly, Department of Co-operation and Community Development, Institutional Finance and special programmes for weaker sections were also its part. Now they have been put under the Department of Rural Development.

The Department of Agriculture has got these wings : (i) Crop production, (2) Forests, (3) Fisheries, (4) Animal Husbandry and Dairying, (5) Land Reforms, (6) Inputs and Machinery, (7) Economic Policy, Statistics and Marketing, (8) Extension, Training and Communication, and International Agricultural Relations and Technical Aid.

The specialised offices are : (i) Indian Council of Agricultural Research ; (2) Directorate General of Central Farm ; (3) Agricultural Prices Commission ; (4) The Directorate of Extension ; and (5) Directorate of Economics and Statistics.

Besides, many subordinate offices are attached to the Departments which are entrusted with carrying out the programmes of the Ministry. Important of such offices are Directorate of Plant Protection ; the National Seeds Corporation, Central Warehousing Corporation ; Office of the Agricultural Marketing Adviser, Agro-Industries Corporation, Agricultural Refinance Corporation, Food Corporation of India ; Soil and Water Conservation Board, Fertilizers Corporation of India, Central Board of Forestry.

Further Committees and Commissions are set up from time to time, to advise the Ministry on important matters. Some of these are Panel of Economics, Panel of Experts on Agricultural Administration, Panel of Agricultural Scientists, Panel of Farmers etc.

Other agencies are Committee for the Improvement of Agricultural Statistics, National Committee on farm Management ; Study Group on Wild Life and Wild Life Products ; Indian Board of Wild Life ; Central Forestry Commission ; Board for Agricultural Machinery and Implements ; Standing Committee of Experts on Manures and Fertilizers ; Central Council for Gosamivardhan Central Board of Fisheries. etc.

The Central Government undertakes the following functions in the field of agriculture :

(a) Planning of agricultural production targets in collaboration with the Planning Commission ;

(b) Coordination of state agricultural plans, watches their implementation and evaluates their performances ;

(c) Provides financial assistance to States for carrying out agricultural plans by way of grant-in aid, subsidy, and loans ;

(d) Ensures timely supply of agricultural inputs (seeds, fertilizers, implements).

(e) Provides credit facilities for marketing, processing, storage and transport of produce ;

(f) Provides economic incentives to farmers in the form of support prices and remunerative prices ;

(g) Undertakes extension work among the farmers through field experiments ; demonstration, extension education etc.

(h) Provides the services of technical experts to the State Governments ;

(i) Develops livestock, fisheries etc.

(j) Prepares forest development plans ;

(k) Land reclamation. soil conservation and desert development ;

(l) Undertakes research in various fields allied to agriculture ;

(m) Provides/controls/guides agricultural universities. Home Science College and Nutrition Institutions.

The Central Ministry implemented the agricultural development programmes under the Plans ; and launched the 'New Strategy' or 'Green Revolution' schemes and special development programmes for small Farmers, Marginal Farmers, Rural Unemployment, Drought-prone Areas, Hill Area Development Programmes etc. .

STATE AGRICULTURAL DEPARTMENTS

Functions of the State Agricultural Departments

The Reserve Bank's publication on 'State Aid to Agriculture' sums up the work of the State Governments thus : "The measures adopted by the State Governments include enactment of laws to control moneylending, to scale down debts and ensure fixity of tenure ; starting grow more-food schemes and the giving of free grants, loans and subsidies in this connection ; distribution of improved seeds, manures, and fertilizers on a subsidised basis, providing of irrigation facilities to improve the soil, attempts to grow more fruits and vegetables, efforts to improve the quality of the livestock and so forth."

The main function of the State Governments comprise of the supervision and control of (i) agricultural education, (ii) agricultural research, (iii) demonstration and propaganda, (iv) technical improvements, and (v) distribution of improved seeds, implements, manures and fertilizers, etc.

AGRICULTURAL EDUCATION AND RESEARCH

Agricultural Education

Under agricultural education, the following schemes have been in operation ; (a) establishment and development of agricultural universities ; (b) development of agricultural, veterinary and dairy science ; (c) improvement of agricultural colleges ; (d) award of scholarships and fellowships to undergraduate and post graduate students of agriculture ; (e) establishment of centres of excellence ; (f) organisation of Summer Institutes ; (g) provision of higher education in food and nutrition in agricultural colleges and universities.

Instruction in agriculture is imparted at different levels. At the primary stage agricultural bias is sought to be given by means of nature study. In nearly all States agricultural middle schools have been opened to impart practical training in agriculture and the trainees are expected to go back to the land after completing their course. Advance courses in scientific agriculture is provided in the Agricultural Universities of Poona, Jorhat, Kalyani, Ludhiana, Simla, Udaipur, Jabalpur, Bangalore, Coimbatore, Pantnagar, Nagpur, Kanpur, Akola, Ahmedabad, Bhubneshwar, Hissar, Faizabad. There are 45 agricultural colleges, and 20 veterinary colleges in India which impart agricultural and Veterinary education both theoretical and practical. They also carry on research on agricultural problems either independently or under the guidance of the I.C.A.R. if the subject be of all-India importance. The research relates to the evolving of better varieties of seed from the point of yield and resistance to disease and drought to his crops are subject, better implements and manures, etc. The results of these researches are then tested on experimental farms attached to the Colleges or the Research Institutes.

Rural Institutes have been functioning at 12 centres, viz., Sriniketan (W. Bengal) Gandhidham and Coimbatore (Tamil Nadu), Udaipur ; Jamnagar (Gujarat), Brionli (Bihar), Bichpuri (U.P.), Gargoti, Amrawati and Wardha (Maharashtra) Rajpura (Punjab), Tavanur (Kerala) Indore (M. P.) and Hanumanamathi (Karnataka), to prepare students for diploma courses in rural science, civil and rural engineering and sanitary inspectors.

Agricultural Research

Research forms the backbone of development of agriculture on scientific lines. Most of the advanced nations of the world have developed and achieved Agricultural Revolutions because of sustained and systematic research. The importance of research in agriculture was brought home by the Royal Commission on Agriculture as early as 1928. It observed : "The basis of all agricultural progress is experiment. However, experience showed that the organisation which is built up for demonstration and propaganda, is merely a house built on sand." In spite of marked progress which has been made in many directions during the last quarter of the century, it is hardly an exaggeration to say that agricultural research in this country is still in its infancy.

As a result of the recommendation of the Commission Imperial (now Indian) Council of Agricultural research was set up in 1929 to undertake these functions: (i) undertake, aid promote and co-ordinate agricultural and animal husbandry education and research ; (ii) to act as a Clearing House of information not only in regard to research but also in agricultural and veterinary matters generally ; (iii) to establish and maintain a research and reference library ; and (iv) to do all other things which the Council may consider necessary, incidental or conducive to the attainment of its objects.

The *Famine Enquiry Commission*, 1945 advocated a certain degree of phasing in the extension of research, instruction and the training of research workers. It recommended a system of pilot schemes with the object of demonstrating the results of research and improved farming methods to cultivations. It emphasised that agriculture should be recognised as one of the most important activities.

The *First Five Year Plan* observed that the use of improved varieties of seed, and preparation and use of compost manures and fertilizers were the results of research but lack of a properly trained extension service had retarded this process. It rightly stressed the role of universities in promoting agricultural research so that they could answer the increased demand for research ; and that representatives of progressive cultivators, traders and processors should be associated with the drawing up of annual research programmes. The Report of the Joint Indo-American Team on Agricultural Research and Education, 1955, also stressed the same points. The Black-Stewart Report, 1955 stressed the importance of agro-socio-economic

research in the country. By 1950, there were : the Indian Council of Agricultural Research, 9 Central Research Institutes and 17 Central Commodities Committees besides research stations and farms of the State Government.

The *Agricultural Administration Committee*, 1958, pointed out that "the total research under way is inadequate to meet the needs and demands for improved agricultural methods and practices of Indian farms." It remarked that "without adequate research extension would be like an empty pipe-line costly alike to the people who paid for it and to the Government that built it." It emphasised the need for establishing major research stations for serving the needs of each agro-economic research climate and tract and for having a particular type of soil and climate and for having at least 50 major research stations. It also stressed the need for a separate section for carrying on technical and research work in the field of agricultural economics.

The *Ford Foundation Team*, 1959, stressed the importance of research in agricultural economics especially farm management research, that could provide guidance to food production programme.

In the *Third Five Year Plan* a provision of Rs. 28 crores was for agricultural research. For crops like wheat, rice, millets, cotton and oilseeds, research facilities have been developed on a regional basis in addition to the work undertaken by the States.

The Indian Council of Agricultural Research has been reorganised so that a national programme of agricultural research could be developed and administered properly. Administrative control of all Research Institutes (which were previously controlled directly by the Ministry of Food Agriculture) was transferred to the reorganised council from April 1966.¹

Similarly, the administrative control of 8 Commodities Research Institute was also transferred to the Council.²

-
1. These are : (i) Indian Agricultural Research Institute, New Delhi ; (ii) Indian Veterinary Research institute, Izatnagar ; (iii) National Dairy Research Institute, Karnal ; (iv) Central Rice Research Institute Cuttack ; (v) Central Tobacco Research Institute, Rajahmundry ; (vi) Central Arid Zone Research Institute, Jodhpur ; (vii) Central Tuber Crops Research Institute, Trivandrum ; (viii) Central Sheep and Wool Research Institute, Avikanagar, (ix) Indian Grass Land and Fodder Research Institute, Jhansi, and (x) Central Potato Research Institute, Simla.
 2. These Institutes are : (i) Indian Lac Research Institute, Namkum, (ii) Jute Agricultural Research Institute, Barrackpore, (iii) Technological Research Laboratory (Jute), Tollygunge, (vi) Central Coconut Research Station, Kasargod ; (vi) Central Arecanut Research Station, Vittal ; (vii) Technological Research Laboratory (cotton) Matunga, (viii) Institute of Horticulture Research, Bangalore.

All the three Fisheries Research Stations have also been transferred to the Council.

The Central Marine Fisheries Research Station, Mandapam, carries out biological investigations on edible fish found in the coastal water of the country. Research stations have been set up in Bombay, the Gulf of Kutch, Vishakhapatnam and the Andamans.

The Central Inland Fisheries Research Station, Barrackpore (Calcutta), deals with estuarine, riverine, lacustrine and pond fish.

The Central Fisheries Technological Research Stations of Cochin and Ernakulam undertake studies in fishing gear material, gear, design, fishing method and preservation of fish and fish products.

The ICAR

The ICAR (set up in 1929) is the national body for coordinating research, education and extension education in the fields of agriculture, animal husbandry and fisheries sciences. The Council gives support for the setting up and development of agricultural university in states. The Department of Agricultural Research and Education in the Union Ministry of Agriculture and Irrigation provides administrative support to the ICAR and coordinates the work of central and state agencies. The ICAR functions through a net work of 30 well equipped research institutes, a Directorate of All-India Soil and Land use Survey, 21 agricultural universities, 51 all-India coordinated projects.

The ICAR works through :

- (1) The Indian Agricultural Research Institute, New Delhi (which was transferred from Pusa to Delhi in 1936).
- (2) The Indian Institute of Veterinary Research at Izatnagar (U. P.).
- (3) The National Dairy Research Institute. Karnal (Haryana);
- (4) The Indian Institute of Sugarcane Research, Lucknow (U. P.).
- (5) The Creamery at Anand (Gujarat)
- (6) Indian Lac Research Institute at Namkum, Ranchi (Bihar)
- (7) Sugarcane Breeding Station at Coimbatore (Tamil Nadu)
- (8) The Central Rice Research Institute at Cuttack (Orissa)
- (9) The Central Potato Research Institute at Simla (H. P.)
- (10) The Central Vegetable Breeding Station at Kulu. (H. P.)
- (11) Central Tobacco Research Institute at Rajahmundry (Andhra Pradesh)
- (12) Jute Agricultural Research Institute Nilgunge, Barrackpore (W Bengal)

Agricultural Problems of India

- (13) Central Coconut Research Station, Kasargod (Kerala)
- (14) Central Arid Zone Research Institute, Jodhpur (Rajasthan)
- (15) Central Tuber Crops Research Institute, Trivandrum (Kerala)
- (16) Central Sheep and Wool Research Institute, Avi-Kalagar (Madhpura) (Rajasthan)
- (17) Central Plantation Crops Research Institute, Kasargod (Kerala)
- (18) Indian Institute of Horticultural Research, Bangalore (Karnataka)
- (19) Cotton Technological Research Laboratory, Bombay
- (20) Indian Grassland & Fodder Research Institute, Jhansi (U. P.)
- (21) Central Inland Fisheries Research Institute, Barrackpore, (W. Bengal)
- (22) Central Institute of Fisheries Technology, Ernakulam, (Kerala)
- (23) Central Arecanut Research Institute Vittal (Karnataka)
- (24) Central Marine Fisheries Research Institute, Mandapam (Tamil Nadu)

In general, the ICAR coordinates research work, suggests programmes of research, groups financial assistance for approved schemes and also undertakes schemes of its own. It acts as a 'clearing-house' for scientific information.

The council has a number of Standing Committees at work, the more important of which are : the Wheat, Rice, Sugar, Animal Nutrition, Cattle Breeding, Dairying, Fertilizers, Locust, Soil Science, Dairy Farming, Oil Crushing Industry, the Fodder and Grazing Standing Committees.

The Council was completely reorganised in 1951 to enable it to discharge its responsibilities more effectively, especially in the field of extension work. Steps have also been taken to set up extension service on a national basis to bridge the gulf between the research workers and the farmers. The governing body is now assisted by a Board of Research and a Board of Extension.

The annual grants made to I.C.A.R. fall under two main heads: (i) an annual government grant for running the administration. This varies from year to year according to requirements ; and (ii) payment of the net proceeds of the cess on agricultural produce. Besides these, specific grants are made to I.C.A.R. for undertaking certain schemes from time to time.

The I. C. A. R. has done some useful work in evolving new and disease-resistant varieties of crops, especially wheat, rice,

millets, maize, cotton, pulses and tubers. Promising results have been obtained in evolving high-yielding varieties resistant to parasitic weeds.

After 1947, it was decided to plan agriculture and animal husbandry on a regional basis. According to this decision, research schemes hereafter are classified as fundamental, regional and local. The fundamental items are allotted as far as possible to the Central Institutes, universities, and other stations such as the Central Commodity Research stations. Regional problems are financed on a contributory basis by I. C. A. R. and the State best suited to take up a particular item of research. Local problems are assigned to the respective State Departments.

The regions are five in number viz., Wheat, Rice, Malabar rice, Millet and Himalayan. (i) *Dry Northern Region* (Wheat) comprising the Punjab, Haryana, Western U. P., Western Madhya Pradesh and Rajasthan; (ii) *West Eastern (Rice) Region* comprising Assam, Nagaland, Arunachal Pradesh, Meghalaya, Manipur, Tripura, West Bengal, Bihar, Orissa, eastern Madhya Pradesh, eastern U. P., and north-east Madras; (iii) *Coastal Region* comprising the two coastal strips in South India bordering on the Eastern and Western Ghats, parts of Karnataka and Kerala; (iv) *Southern (Millet) Region* comprising Jhansi region of Uttar Pradesh, Madhya Pradesh, eastern Andhra, west Tamil Nadu, Maharashtra and parts of Karnataka; (v) *Temperate Himalayan Region*, consisting of two sub-regions, viz., the Eastern Himalayan Region including Assam (hilly), Sikkim, Bhutan, and the Western Region including Kumaon, Garhwal, Kulu, Chamba and Kashmir.

Unfortunately the results of the laboratories have not fully reached the villages and have failed to establish a living and organic link with the field. Therefore, unless the "steam of knowledge is duly canalised so as to fertilize the actual fields and farms its research work is of little value. Divorce between the farm and the laboratory prevents any fruitful use of the results of research. Hence, better and vigorous publicity is needed. In the second place, research is being conducted in an isolated fashion and there is little co-ordination. As in our agriculture, so in our agricultural research, 'fragmentation' has been the bane." Another defect is that little attention is being paid to economic aspect of agricultural research. Unless methods suggested are paying and their application is within the means of cultivator, the research is of little avail. A close co-ordination is also needed between agricultural research and economic research. Also closer collaboration is required between the technical experts and the economists. For instance, investigation into food crops must be conducted in consultation with human nutrition experts. Above all, "Research should be inspired by a sense of relevance and urgency in view of the serious food situation."

Agricultural Extension Work

In view of the fact that the Indian experimental stations have been functioning for so many years it seems at first surprising that so little of the work done has found its way into the general body of agricultural science as expounded in the standard treatises. The work has been really confined to the laboratory and the experiment station. It has not been brought into living organic relationships to the work on the fields.

With a view to advancement of research and the efficiency of agricultural production, it is essential that the discoveries made and the conclusions arrived at in the various spheres of Indian agriculture should be compiled and made available to the rural areas in a convenient and accessible form. In this connection Sir John Russell rightly emphasised. "It should be impressed upon the staff at the experiment stations that they have a responsibility to the cultivator, that they must not shelter within four walls of the laboratory in the hope that somehow their work may find practical application : they must make the field and the crop their centres and as early as possible set out experiments on the cultivator's land so as to widen the scope of their enquiry. They should be expected to carry out simplified forms of their experiments on a cultivator's land unless there be good reasons to the contrary."

No single dose of extension efforts can motorize agricultural growth. It should be a continuous process. An efficient extension machinery must facilitate two-way traffic, i.e., the problems of the farmer must be carried back to the authorities as well as to laboratories according to their nature ; and innovating and enlightened type of farmers should be identified and associated with the process of extension. But such efforts are very negligent in the states. Identifying leading farmers and encouraging them actively to assume leadership in their areas is a desirable extension technique and hence, should be rigorously pursued.

Coordination in programming and implementation is essential for successful extension work.

The success of American agriculture is largely due to the splendid work of coordinated programming carried out by the Agricultural Department. Organised on the principle of centralised policy making and decentralised operation, the Agricultural Department's innumerable operating units such as the Agricultural Adjustment Administration, the Soil Conservation Service, Farm Credit Administration, the Bureau of Agricultural Chemistry and Engineering, etc. work in unison. The Bureau of Agricultural Economics, the Department's central planning agency, formulates over all plans and programme of action in the fields of production, distribution, land utilization and conservation." In India the co-operatives, the village panchayats, the N.E.S. Block, the Agricultural Department till recently did

not have an integrated approach to agricultural production. Drawn from different departments the extension personnel like the Extension Officer, Co-operation ; the Agricultural Extension Officer, the Extension Officer, Industries ; and the Veterinary experts have divided loyalty. Agriculture Department is only one among the many in agricultural programming. As far as extension work is concerned, even the Director of Agriculture is not having an important role, such an institutional set up does not help the diffusion of technology in any substantial measure.

The extension work may prove abortive if the farmer is not absorptive. Farming is a technology involving several factors such as social values, farm management, use of chemicals, machinery, livestock, etc. Increased education would help a lot in spreading farm technology. So far as agricultural education is concerned, the Ford Foundation Team has recommended that instead of having the uniformity of agricultural college syllabi, each institution, should be encouraged to develop its own programmes based on the geographical area it serves and the problems of agriculture in the community. In their view, instead of increasing the number of agricultural colleges and training institutions, it should be desirable to expand and consolidate those already in existence. Where possible agricultural and animal husbandry institutions should be located in the same campus to permit economies of teaching of basic courses and to encourage joint teaching of such courses as forage and feed production, animal breeding and genetics, livestock and marketing rural sociology, etc.

Side by side with the types of agricultural education intensive publicity should be carried on in the countryside in season and out of season according to a definite programme to educate the people in improved methods of agriculture suitable for the conditions of each area. It should be remembered in this connection what Brayne has said, "Well organised publicity greatly increases the amount of work done by each rupee of Government money spent on rural reconstruction. The neglect of publicity is, therefore, a very short-sighted economy. Adequate propaganda connotes adequate funds for it and it is better not to have any propaganda at all rather than a half hearted propaganda." The success of publicity very largely, if not wholly, depends upon its personnel. As Brayne has put it, "Publicity is a technical subject. It is one thing to have a message for the villager. To deliver that message effectively is quite another thing, and the technique has to be specially learnt. All, therefore, who are trying to teach the villager new ways and to popularise new things should receive definite training in publicity methods and technique." The publicity man should not only possess a capacity to talk well in the language of the people but should also have a full knowledge of the subject of his talk and of the suitability or otherwise of the locality and of the people for the application of the knowledge. As regards the methods of publicity all the modern methods, such

as wireless, cinema, dramas, songs and dances, verses, leaflets, pamphlets, posters, models, exhibitions, shows, competition, meetings, demonstrations, press etc., may be adopted. But of these the most important are demonstrations, special week, and exhibitions and shows, etc.

Appendix 1

I. Agricultural Universities

1. Gujarat Agricultural University, Ahmedabad.
2. University of Agricultural Sciences, Bangalore.
3. Tamil Nadu Agricultural University, Coimbatore.
4. Orissa University of Agriculture and Technology, Bhubneshwar.
5. Punjab Rao Krishi Vishwavidyalaya, Akola (Maharashtra).
6. Bidhan Chandra Krishi Vishwavidhyalaya, Kalyani (W. Bengal).
7. Assam Agricultural University, Jorhat (Assam).
8. Udaipur University, Udaipur.
9. Jawaharlal Nehru Krishi Viswa Vidhyalaya, Jabalpur.
10. G. B. Pant University of Agriculture and Technology, Pant Nagar (U. P.)
11. Himachal Pradesh University, Simla.
12. Haryana Agriculture University, Hissar.
13. Narendradev University of Agriculture and Technology, Faizabad (U. P.)
14. Azad University of Agriculture and Technology, Kanpur.
15. Rajendra Agriculture University, Bihar.
16. Marathwada Krishi Vidhyapeeth, Parbhani (Maharashtra).
17. Mahatma Phule Krishi Vidhyapeeth, Rahuri.
18. Punjab Agricultural University, Ludhiana.
19. Andhra Pradesh Agricultural University, Hyderabad.

II. Other Institutions of the Higher Learning in Agriculture

1. Indian Council of Agricultural Research, New Delhi.
2. Indian Dairy Research Institute, Bangalore.
3. Indian Veterinary Research Institute, Izatnagar.
4. National Dairy Research Institute, Karnal.
5. Central Institute of Fisheries Education, Bombay.
6. Central Institute of Fisheries Operatives, Cochin.
7. Allahabad Agricultural Institute, Naini.
8. Home Sciences Colleges run by Baroda University and the Agricultural University of Andhra Pradesh, Ludhiana and Udaipur.
9. Indian Institute of Technology, Kharagpur.

Agriculture Through the Plans

Agricultural Situation on the Eve of Independence

The economic situation at the commencement of the First Plan was quite unfavourable. The levels of income and consumption had been very low. Consequent on the partition and the effects of the Second World War, the country was faced with severe food shortage and deficit in raw materials. Industrial production was also below capacity levels. Transport system had been severely run down. The rehabilitation of a large number of displaced persons demanded urgent consideration. The outbreak of the Korean War in June, 1950 and the bad crop season in 1950-51 further aggravated the situation. The occupational pattern was very defective as many as 64 per cent of the people depended on agriculture. As a result of partition, the country had suffered severely. India was left with 82 per cent of the total population of undivided India but with only 69 per cent of land under rice, 65 per cent under wheat and 75 per cent under cereals; and 70 per cent area under irrigation. The cultivators were under heavy debt of the moneylenders and the holdings were quite uneconomic. The farmers faced so much exploitation at the hands of the intermediaries on land that they had practically lost enthusiasm in their vocation.

AGRICULTURE IN THE FIRST PLAN (1951-56)

The First Plan was launched with two-fold objectives, viz., to correct the disequilibrium in the economy and to initiate simultaneously a process of all round balanced development which would ensure a rising national income and a steady improvement in living standards.

Agriculture, including irrigation and power, was given the top-most priority in the Plan because without a substantial increase in the production of food and basic raw materials for industry, it would be impossible to sustain a higher tempo of industrial development. Accordingly, out of a total outlay of Rs. 1,960 crores, Rs. 290 crores were earmarked for agricultural and community development (i.e.,

14.8 per cent of the total outlay) Rs. 310 crores for major and medium irrigation (i.e., 16 per cent), and Rs. 260 crores for power development (i.e. 13 per cent).

The First Five Year Plan laid special emphasis on agricultural development. It envisaged the following increases in agricultural production :¹

It was proposed in the Plan to increase the production of food grains from 54 million tons to 62.59 million tons; of oilseeds from 5.16 million tons to 5.57 million tons ; of cotton from 2.87 million bales to 4.21 million bales; of jute from 3.3 million bales to 5.4 million bales and of sugarcane from 5.7 million tons to 6.4 million tons during the Plan period. For this purpose about 16 per cent of the expenditure in the Plan was earmarked for agriculture and community development projects and another 17 per cent for multi-purpose irrigation projects.

Targets of Agricultural Production under First Plan

Commodity	Unit	Production in the base Year	Targets of additional production	Percentage increase
Foodgrains	Million Tons	54.8	7.6	14
Major oilseeds	do	5.1	0.4	...
Sugarcane (gur)	do	5.7	0.7	13
Cotton	Million bales	2.9	1.3	45
Jute	do	3.3	2.1	64

In order to achieve the programme of higher agricultural production, stress was laid primarily on improved tillage, viz., adoption of better cultivation methods, use of more fertilizers and improved seeds and a more plentiful and assured supply of water. A special campaign was started to propagate intensive cultivation of rice by the Japanese method of paddy cultivation. Campaigns were also organised for the development of intensive cultivation methods in case of crops like sugarcane. Apart from the technological improvements, attention was to be paid to the adoption of measures which would improve the psychology of the cultivator, give him an incentive and determination to improve his agricultural techniques and efficiency. These took the form of reform of land tenures and tenancy systems, organisation of co-operative action and development of suitable links between the cultivators on the one hand and sources of supply, research centres and marketing organisations, on the other. Provision was also made for the improvements in other related spheres like marketing, fisheries, animal husbandry, soil conservation and forestry.

The three remarkable features about agricultural planning in the First Plan were :

- (a) The work was to be organised entirely by the State Governments. They were to manage the irrigation and power projects and the Central Government was to co-ordinate the work and to give general assistance.
- (b) The main emphasis was on long-term projects, the full advantage of this planning was to be felt after a period of 15 to 20 years when Indian agriculture will come to its highest development.
- (c) The object of the Plan was not only to increase agricultural production but to bring about an all-round development in rural life.

Achievement of the First Plan

The success achieved during the First Plan even exceeded the targets. The table below shows the course of agricultural production during the First Plan Period.¹

Achievements of Agricultural Production during First Plan

Commodity	Unit	1951-52	1953-54	1954-55	1955-56	Achievement over (+) under (-)
Cereals	Million tons	42.9	58.3	55.3	54.9	—
Pulses	do	8.3	10.4	10.5	10.9	—
Total Food grains	do	51.2	68.4	65.8	65.8	4.2
Major Oilseeds	do	4.9	5.3	5.9	5.7	0.1
Sugarcane	do	6.1	4.4	5.5	6.0	-0.3
Cotton	Million bales	3.1	3.9	4.3	3.9	-0.2
Jute	do	4.7	3.1	2.9	4.2	-1.2
Total		95.6	114.3	116.4	116.8	—

The index number of agricultural production increased from 95.6 in 1950-51 to 114.3 in 1953-54 and 116.8 in 1955-56. The targets of production set out in the Plan were exceeded in the case of food-grains (69 m. tons) and oilseeds (6.2 m. tonnes) in 1953-54 ; while in the case of cotton, the target was exceeded in 1954-55. In the case of jute and sugarcane, production had gone down in 1952-53 and 1953-54 but there was a remarkable recovery in their production in 1954-55 and 1955-56. Sugar production reached the record figure of 15.9 lakh tons in 1954-55 but in 1955-56 we manufactured 18.7 lakh tons.

Agricultural production showed distinct improvement over the Plan period. The output of foodgrains in 1955-56 at 65.8 million tons

1. *Second Five Year Plan*, 1956, p. 256 ; *Agricultural Statistics of Reorganised States*, 1956, pp. 68-71. *Third Five Year Plan*, p. 302.

was nearly 11 million tons above the production level of 1949-50. The turning point came in 1953-54 with a peak production of 68.4 million tons of foodgrains. This was followed by another good crop in 1954-55 when the foodgrains output was 65.8 million tons. The overall production increased by 17 per cent and that of foodgrains was stepped up by 11 million tons. Therefore, the imports of foodgrains were curtailed considerably. They decreased from 4.73 m. tons in 1951 to 2.00 m. tons in 1953; to 0.89 m. tons in 1954 and to 0.59 m. tons in 1955. There was an increase of 25 m. acres in the net sown area. The area under foodgrains also increased by 25 m. acres; and the gross area irrigated by 7.5 m. acres. As a result of increase in foodgrains, the price index for agricultural commodities (1952-53=100) came down to 92.8. The price index of cereals fell by 24 points, and that of pulses, sugar and oilseeds came down by 38, 11 and 15 points respectively. Unfortunately much institutional reforms could not be undertaken. Cooperative farming movement was not very successful and even sub-division and fragmentation of land could not be completely rooted out.

AGRICULTURE UNDER THE SECOND PLAN (1956-61)

At the end of the First Plan, the country appeared to be out of the woods. Against this background the Second Plan was drawn up to meet the increasing demand for food and raw materials on account of growing population and expanding industries.

The targets of production in the Plan were set as follows :

Targets of Agricultural Production Under Second Plan

Commodity	Unit	Estimated Production 1955-56	Revised target of Production	Percent Increase index of production (as revised in the Plan)
Foodgrains	Million tons	66.04	81.79	24
Oilseeds	do	5.59	7.72	38
Sugarcane	do	5.89	7.93	35
Cotton	Million bale	4.15	6.42	55
Jute	do	4.03	5.54	38
Coconut (oil)	Lakh tons	1.3	2.1	62
Areca nut	Lakh mds.	2.20	27.0	23
Lac	do	1.20	16.0	33
Black pepper	000 tons	2.60	36.0	37
Cashewnut	do	6.00	106.0	77
Tea	Million lbs.	54.40	700.0	18
All Commodities				27

The target of foodgrains production was put at 15.5 million tons that is an increase of 24 percent over the estimated production for 1955-56. The production of oilseeds, sugarcane, cotton and jute

was expected to go up by 38, 35, 56 and 58 per cent respectively, while agricultural production as a whole represented an overall increase of 27 per cent.

The higher production was envisaged to be achieved largely through improved techniques and propagation of intensive cultivation. But unlike the First Plan, in which emphasis was primarily laid on crop production, the Second Plan aimed at a diversified agricultural economy as it included development of livestock and rural uplift measures side by side with increased crop production. In the programme for improved techniques and the spread of intensive cultivation, important items were : better irrigation facilities, greater use of manures and fertilizers ; more widespread distribution of good seeds ; and extension of the Japanese method of paddy cultivation.

Scheme-wise targets of additional production of foodgrains in the Second Plan were :

Scheme	Additional (Million tons)	Production (Per cent)
Major Irrigation	3.02	19.5
Minor Irrigation	1.89	12.2
Fertilizers and manures	3.77	24.3
Improved Seeds	3.42	22.0
Land Reclamation and Development	0.94	6.1
Improved Agricultural Practices	2.47	15.9
Total	15.51	100.0

As against Rs. 1,054 crores which were allotted for agriculture, the actual amount spent was Rs. 950 cr. Rs. 530 cr. were devoted to agriculture and community development programme and Rs. 420 cr. to major and minor irrigation. This accounted for about 20 per cent of the total outlay as against 31 per cent in the First Plan.

Achievements Under the Second Plan

The tempo of agricultural development was accelerated during the Plan period, resulting in an increase in production by 19 per cent. Foodgrains output increased by about 13 million tons (though the target was 15.5 million tons)—the rate of increase being about 4% per year.

The following data show progress in agricultural production.

Progress of Agricultural Production under the Second Plan

Commodity	Unit	1956-57	1957-58	1958-59	1959-60	1960-61	Over-achievement (+)
							Under-achievement (—) over the Targets
Cereals	Million tons	57.4	53.4	62.6	63.2	68.8	—
Pulses	do	11.4	9.5	12.9	11.5	12.5	—
Total food-grains	do	68.8	62.5	75.5	74.7	79.3	0.7
Oilseeds	do	6.3	6.1	6.9	5.9	6.5	1.1
Sugarcane	do	6.8	6.9	7.1	7.7	10.4	+ 2.6
Cotton	Million bales.	4.7	4.7	4.7	3.7	5.4	— 1.1
Jute	do	4.3	4.1	5.2	4.6	4.0	— 1.5
All Commodities		124.0	114.6	132.3	128.7	139.7	—
Index No. (1949-50 11100)							

It may be pointed out that special attention was devoted to increase the production of foodgrains and other cash crops by expansion of cultivation to new lands but primarily through intensification of inputs and improvements in yields per acre.

The measures undertaken related to *work scheme programmes* such as the adoption of improved agricultural practices—comprising Japanese method of rice cultivation, double-cropping, proper spacing and seed rates, proper transplanting methods and eradication of weeds—construction and repairs of wells, tanks, dams, channels and tube-wells, the installation of water-lifting appliances; schemes of contour-bunding and clearance, reclamation of waste lands and consolidation of holdings.

Besides these, other programmes were undertaken under the title of *supply schemes* which included the distribution of fertilizers, organic measures, improved seeds and plant protection, digging of compost pits, bringing maximum areas under green manuring, afforestation and soil conservation programmes, insecticides and pesticides, improved village practices.

Special crop campaigns were also launched to intensify agricultural production, especially of rice, bajra, ragi, maize and jowar both during the *kharif* and *rabi* crops. Schemes of institutional reforms were also included in the programme because it was realised that technological and technical devices and education will be of no avail in improving agriculture, unless institutional reforms in respect of land ownership and in distribution, security of tenures and its stability first provided necessary basis for more efficient agriculture.

The poor progress of agriculture, during the Second Plan, led to a rise in the price level. The percentage increase between 1956 and 1961, in the prices of cereals was 37, pulses 50, sugar and gur 61, oilseeds 76, cotton 43 and all commodities 35. Secondly, imports had to be resumed for shortage of foodgrains. As against an import of 1.4 m. tonnes of foodgrains in 1955-56 the imports increased to 3.9 m. tonnes in 1959-60 and to 15. m. tonnes in 1960-61. As against 21 m. acres of additional land to be brought under irrigation, the actual achievement was about 16 m. acres only; and even the facilities made available were not fully utilised. The programmes which require large-scale participation on the part of the people, such as soil conservation, made only limited progress.

Achievements During the Decade 1951-61

As a result of the above measures, taking the decade as a whole, agricultural production expanded by about 41 per cent and that of foodgrains by about 46 per cent. The total outlay on agriculture, community development and irrigation amounted to Rs. 1,551 crores during the decade.

Agricultural production advanced at a rate of 3.84 per cent per year. Foodgrains showed an increase over the period of 3.73 per cent per year. Among non-foodgrains, cotton production rose by 7.43 per cent per year followed by sugarcane 5.09 per cent oilseeds 4.26 per cent and jute 2.19 per cent. Productivity of all-crops increased at the rate of only 1.54 per cent per year, that of foodgrains 1.70 per cent and non-foodgrains 0.83.

Progress of Agricultural Production, 1950-1960

Item	Unit	1950-51	1960-61
Index of Agr. Production (1949-50=100)	—	95.5	139.6
Foodgrains	Million tons	52.2	71.7
Nitrogenous fertilizers	000 tons of N	55.0	230.0
Area Irrigated	Million acres	51.5	70.0
Oilseeds	Million tons	5.1	7.1
Sugarcane (gur)	„ „	5.6	8.0
Cotton	„ bales	2.9	5.1
Jute	„ bales	3.3	4.0

The net area irrigated was estimated to have increased from 51.5 million acres in 1950-51 to about 70 million acres in 1960-61. About 4 million acres were reclaimed by the end of 1960-61. Mechanical cultivation was extended to 0.5 million acres and land improvement to about 1.5 million acres. About 4,000 seed farms were established under a scheme to cover the entire cultivated area of the country with improved seeds. The consumption of nitrogenous

fertilizers increased from 55,000 tons to 2,30,000 tons and of phosphatic fertilizers from 7,000 to 70,000 tons between 1950-51 and 1960-61. About 11.8 million acres were estimated to be under green manuring. About 2.7 million acres were covered by soil conservation measures. Measures were also taken for the development of livestock and fisheries, milk supply, vegetable and fruit cultivation and afforestation. The production of milk went up from 17 million tons to 22 million tons, of fish from 0.7 million tons to 1.4 million tons. Afforestation programmes covered about 0.5 million acres. The community development movement covered about 3,70,000 villages and well over half of the country's rural population.

In spite of fluctuations from year to year, there was an overall expansion. The average level of foodgrains production of about 50 million tons in the preceding decade was exceeded early in the First Plan and amounted to over 76.1 million tons in 1960-61 as against 57.6 million tons in 1949-50 and 52.2 million tons in 1950-51. The average yield per acre also rose significantly over the decade. For example, the average yield of rice increased from 600 lbs. in 1950-51 to 807 lbs. in 1960-61 and that of wheat from 590 lbs. to 662 lbs.

With the increase in the net availability of foodgrains, the per capita consumption increased from 13.5 ozs. to 15.7 ozs. ; and that of milk being only 4.9 ozs. as against a minimum of 10 ozs. per head per day.

AGRICULTURE UNDER THE THIRD PLAN (1961-66)

The Planning Commission observed : "In the scheme of development during the Third Plan the first priority necessarily belongs to agriculture. The experience in the first two Plans has shown that the growth of rate in agricultural production is one of the main limiting factors in the progress of Indian economy. Agricultural production has, therefore, to be increased to largest possible extent feasible.....Both in formulating and implementing programmes for the development of agriculture and the rural economy during the Third Plan, the guiding consideration is that whatever is physically practicable should be financially possible and the potential of each area should be developed to the most extent possible."

The *Third Plan* provided for an outlay on agricultural programmes including large and small irrigation schemes, soil conservation and co-operation, of about Rs. 1,281 crores, comparable outlay in the Second Plan being of the order of about Rs. 667 crores. These programmes aimed at nearly doubling the rate of growth of agricultural production. The Plan set two specific priority goals to be reached, viz., (i) *to produce enough foodgrains to be self-sufficient ; and (ii) to produce enough commercial crops to meet the needs of exports and industry.*

With these goals in mind, a target of stepping up agricultural production as a whole by 30 per cent was set. Foodgrains production was to be increased by about 32 per cent, of rice by 41 per cent, of wheat 50 per cent and of pulses 42 per cent. That of commercial crops, the targets of increase were set as 38 per cent for oilseeds, 25 per cent for sugarcane, 37 per cent for cotton and 25 per cent for sugarcane, 37 per cent for cotton and 55 per cent for jute. These targets called for substantial increases in crop yields per acre—these were expected to be 27 per cent increase in the case of rice, 20 per cent for wheat, 16 per cent for jute, 14 per cent for cotton, 11 per cent for oilseeds and 18 per cent for sugarcane.

The targets fixed for various crops are indicated below. The index number of total agricultural output (base 1959-60=100) was envisaged to rise from 139 in 1960-61 to 176 in 1965-66; and that of the foodgrains from 132 to 171. Thus, the Third Plan assumed substantial stepping up of the annual rate of growth in Indian agriculture.

Targets for Agricultural Products during the Third Plan

Commodity	Base level Production 1960-61	Target of additional production 1960-61	Estimated production in 1965-66	Percentage increase
Foodgrains (million tons)	76.0	24.4	100.0	31.6
Oilseeds („)	7.1	2.7	9.8	38.0
Sugarcane („)	8.0	2.0	10.0	25.0
Cotton (million bales)	5.1	1.9	7.0	37.2
Jute („)	4.0	2.2	6.2	55.0
Coconut (million nuts)	4,500	775	5,275	17.2
Arecanut (000 tons)	93	7	100	7.5
Cashewnut (000 tons)	73	77	150	105.5
Pepper (000 tons)	26	1	27	3.9
Cardamom (000 tons)	2.26	0.36	2.62	15.9
Lac (000 tons)	50	12	62	24.0
Tobacco (000 tons)	300	25	325	8.3
Tea (million lbs)	725	175	900	24.1
Coffee (000 tons)	48	32	80	67.7
Rubber (000 tons)	26.4	18.6	44	79.5

The higher rate of increase was to be brought about by the increased application of technology. These included :

(i) Irrigation was to be put on 20 million more acres (11.5 million acres by major and medium projects and 8.5 million acres by

minor irrigation works), bringing the net total to 90 million acres, nearly half of India's irrigable area.

(ii) Soil conservation measures were to be undertaken on 11 million acres and dry farming techniques were to be adopted on 22 million acres. Land reclamation was to cover about 3.6 million acres.

(iii) The use of fertilizers was to be increased—that of nitrogenous fertilizers by *four fold* (from 2,30,000 tons to 1 million tons), that of phosphatic fertilizers about *six fold*, (from 70,000 tons to 4,00,000 tons) and that of potassic fertilizers by about *eight fold* (from 25,000 tons to 2,00,000 tons). Benefit of green manuring was to be available to about 41 million acres (it was 11.8 million acres in 1960-61).

(iv) A nation-wide and intensive drive was made to introduce improved ploughs and farm implements and stimulate their manufacture.

(v) 800 more seed farms were to be set up and an additional seed store for every development block so that about 150 million acres could be given the benefit of improved seeds.

(vi) Farm extension and rural community development programme were to be extended to all the rural India by October 1963, to cover about 360 million farm people. Rural co-operatives were expanded so as to cover about 60 per cent of the farm families and have a membership of 37 million.

(vii) 1,000 storage warehouses and 9,200 smaller grain storage godowns in the rural areas were to be set up in the country. These were to have a storage capacity of 2.5 million tons and 2 million tons respectively.

(viii) Plant protection measures were to be undertaken on about 50 million acres.

(ix) Co-operative farming was to be further encouraged by starting pilot projects in each of India's 320 districts, with an average of about 10 co-operative farms per district.

(x) 71 more *key village* projects were to be introduced for providing more breeding bulls and developing more fodder and feed resources.

(xi) The production of fish was to be increased from 1.4 million tons to 1.8 million tons ; that of eggs from 60 to 70 per hen per year and the table-birds to be increased to 65 million, that of milk from 22 million tons to 25 million tons and 55 milk supply schemes were to be introduced.

(xii) *Intensive Agricultural District Programme* was to be put in selected districts which have particularly favourable conditions for stepping up farm production.

(xiii) Land reform measures were to be carried out as early as possible, so that both land owners and tenants, free from uncertainties, may go ahead with the work of increasing food production.

It was expected that with the fulfilment of the above targets, the per capita consumption of food-grains was to be 17.5 ozs. (as against 16 ozs. today) and that of cloth 17.2 yards (as against 15.5 yards today).

Achievements Under the Third Plan

During the Plan period there had been steady expansion in the total agricultural effort, and it has been a constant aim to identify and remove technical and administrative weakness in the execution of agricultural programmes. Unfavourable weather conditions had an adverse effect on the volume of agricultural production, as would be clear from the following table :

Progress of Agricultural Production¹

Crop	Unit	1961-62	1962-63	1963-64	1964-65	1965-66	1966-67
Rice	m. tonnes	34.8	31.9	36.5	39.6	30.6	30.4
Wheat	do	12.0	10.8	9.7	12.3	10.4	11.5
Other Cereals	do	22.6	24.3	23.4	25.2	21.1	24.2
Pulses	do	11.6	11.4	9.9	12.4	9.8	8.9
Foodgrains	do	8.10	78.4	79.4	89.0	72.0	75.0
Raw Cotton	m. bales (in bales of 180 Kg. each)	4.5	5.3	5.4	5.6	4.7	4.9
Raw Jute & mesta	„	8.1	7.1	7.8	7.5	5.6	6.5
Sugarcane	m. tonnes of gur	10.1	9.5	10.3	12.0	12.10	9.4
Oilseeds	m. tonnes	7.0	7.1	7.1	10.5	8.0	8.2
Index No. of Agr. Production (1949-50=100)		141.4	137.2	140.5	158.2	132.7	132.4

The best year of the Third Plan, from the point of view of agricultural output, was 1964-65. During the first four years of this Plan, the average increase in agricultural output worked out to be 26%. As a result of the drought conditions in 1965-66, agricultural production was adversely affected. The decline of 17% in agricultural production in 1965-66, was unprecedented and thus the target of 100 m. tonnes could not be realised. The index number of food-grains prices shot up from 118.4% in 1961-62 to 159.9% in 1964-65 and further to 168.8 in 1965-66. The shortage of foodgrains resulted

1. Ministry of Finance. *The Economic Survey*, 1967-68, pp. 8-9.

in imports worth Rs. 1,100 crores between 1961-62 and 1965-66 ; the foodgrains production having fallen from 82.71 m. tonnes in 1961-62 to 72.3 m. tonnes in 1965-66.

ANNUAL PLAN AND AGRICULTURE (1966-69)

The Fourth Plan should ordinarily have commenced in 1966 on the expiry of the Third Plan. But severe stresses and strains had been developing in the economy due to hostilities of 1962 and 1965, steep fall in agricultural production over two successive years in 1965-66 and 1966-67 and the devaluation of the rupee in June 1966. These events necessitated readjustments in planning. It was, therefore, decided that the Fourth Plan should be abandoned for the time being and instead Annual Plans for 1966-67, 1967-68 and 1968-69 be formulated. Accordingly, the three yearly Plans were implemented. The total expenditure on agriculture during the three Annual Plans amounted to Rs. 1,624 crores ; Rs. 1,167 crores or 17% was spent on agriculture and C. D. and Rs. 457 crores or 7% on account of the drought conditions during 1966-67, minor irrigation received a high priority.

Programme of highly yielding varieties along with the requisite application of chemical fertilizer was undertaken. As a result of good rainfall and new technology used in production, foodgrains production rose upto 95.1 m. tonnes in 1967-68. The target for 1968-69 was fixed at 102 m. but due to crop failures in different parts of the country, the actual production was of the order of 94.0 m. tonnes. The progress in agriculture is shown below.

Production of Foodgrains and Commercial Crops¹

Crops	Unit	1965-66	1966-67	1967-68	1968-69
Foodgrains	M. tonnes	72.2	74.2	95.1	94.0
of which					
Rice	"	30.6	30.4	37.6	39.8
Wheat	"	10.4	11.4	16.5	18.7
Coarse grains	"	21.4	24.1	28.8	25.2
Oilseeds	"	6.5	6.4	8.3	5.8
Jute (m. Bales)		5.8	6.6	7.6	3.8
Cotton lint (m. Bales)		4.6	5.0	5.5	.1
Tea (m. kgs)		366	376	314	402
Coffee (090 tonnes)		93.6	78.5	57.3	73.5
Sugarcane (gur m. tonnes)		12.8	9.5	9.8	12.8
Tobacco (000 tonnes)		293	253	369	361

AGRICULTURE AND THE FOURTH PLAN (1969-74)

The Fourth Plan had two main objectives in the agricultural sector. The first aimed at a growth of about 5 per cent per annum

1. *Economic Survey*, 1970-71, pp. 4-5.

over the next decade. The second objective was to enable as large a section of the rural population as possible, including the small cultivator, the farmer in dry areas and the agricultural labourer, to participate in development and share its benefits. Accordingly the priority programmes fell into two categories, namely, those which aimed at maximising production and those which aimed at remedying imbalances.

The pace of development in the agricultural sector set a limit to the growth of industry, of exports, and of the economy as a whole and constituted a major condition for achieving economic and social stability and improving the levels of living and nutrition for the mass of people.

A few selected targets of production for foodgrains and major commercial crops during the Plan period are indicated below :

Commodity	Unit	1968-69 Production	1973-74 Targets
Foodgrains :	Million tonnes	98	129
Rice	"	39.9	52.0
Wheat	"	18.0	24.0
Maize	"	6.2	8.0
Jowar	"	10.0	15.0
Bajra	"	5.1	7.0
Other cereals	"	7.2	8.0
Pulses	"	12.5	15.0
Sugarcane (gur)	"	12	15
Oilseeds	"	8.5	10.5
Cotton	"	6	8
Jute	"	6.2	7.4
Tobacco	"	350	450
Coconut	"	5,600	6,600
Areca nut	"	126	150
Cashewnut	"	131	702
Pepper	"	32	224
Lae	"	53	35

The Plan targets were much higher than the production accomplished in the past. Strategy of production placed very little reliance on bringing additional land under cultivation. It was anticipated that the additional to the net sown area will be only about one million hectares which was the target of land reclamation. The production targets were proposed to be achieved primarily through intensive agriculture based on co-ordinated research, optimum use of irrigation facilities, and use of fertilisers, plant protection material and farm machinery.

The targets for specific elements of the intensive approach to agriculture were as follows :

Targets for Specific Elements

S. No.	Item	Unit	1968-69 (anticipated)	Fourth Plan targets
1.	High-yielding varieties	million hectares	9.20	25.00
	Paddy	Ditto	2.60	10.10
	Wheat	Ditto	4.83	7.70
	Maize	Ditto	0.40	1.20
	Jowar	Ditto	0.70	3.20
	Bajra	Ditto	0.70	2.80
2.	Multiple cropping	Ditto	6.00	15.00
3.	Consumption of chemical fertilizers			
	Nitrogenous (N)	million tonnes	1.14	3.20
	Phosphatic (P_2O_5)	Ditto	0.39	1.40
	Potassic (K_2O)	Ditto	0.16	0.90
4.	Organic manures and green manuring			
	Urban compost	million tonnes	4.00	6.50
	Green manuring	million hectares	8.46	12.00
5.	Plant protection	Ditto	40.00	80.00
7.	Minor irrigation	million hectares (additional)	1.40	7.20
7.	Soil conservation on agricultural lands	million hectares (additional)	1.44	5.65

The Plan outlay for agriculture and allied programmes was Rs. 2,722 crores. Details of distribution of outlay over various programmes were of the following order :

Plan Outlay on Agriculture

(Rs. Crores)

S. No.	Head of Development	Third Plan	Annual Plan (1966-69)	Fourth Plan
1.	Agricultural production	203	252	420
2.	Development of small farmers and agricultural labour			115
3.	Minor irrigation	273	314	156
4.	Soil conservation	77	18	159
5.	Area development	2	13	38
6.	Animal husbandry	43	34	94
7.	Dairying and milk supply	34	26	139
8.	Fisheries	23	37	83

9.	Forests	46	44	93
10.	Warehousing, storage and marketing	27	15	94
11.	Food processing and subsidiary food	(a)	(a)	19
12.	Community development and Panchayats	288	19	115
Total		1,089	1,167	2,722

Special attention was to be devoted to multiplication and distribution of improved seeds. The main components of this programme were : continuous supply of breeder stock, adequate arrangements for production of improved seeds, arrangements for seed processing and storage and seed certification.

The consumption of fertilizers was to be more than three times the 1968-69 consumption level. Plant protection measures were to be provided to 80 m. hectares of land. Soil conservation measures were to be undertaken on 5.39 m. hectares of agricultural land and 0.45 m. hectares of non-agricultural land. About 1 m. hectares of land was to be reclaimed. Dairy farming was to be undertaken in 128 districts with the help of a new package of technology. This was to include soil management, harnessing of water to conserve moisture derived from monsoon, introducing of new short duration crop varieties, and new agronomic practices.

Ten area development schemes were executed in different command areas for speedy agricultural development of areas covered by the respective irrigation projects. The facilities included marketing complexes and certain ancillary facilities such as link roads and storage, facilities to make optimum use of water, custom service for agricultural operations and processing facilities.

Certain distinct trends have been visible in the progress of agriculture since 1969-70. These relate to some important policy measures and programme steps taken by the Union Government Department of agriculture. These are :

- (i) A programme has been launched for both small and marginal farmers and for dry and chronically drought affected areas and for rural employment costing nearly Rs. 385 crores during 1971-72 to 1973-74.
- (ii) In order to achieve self-sufficiency in matters of foodgrains and other crops, new technology and research was developed. A breakthrough in rice had been achieved and further efforts are under way in regard to pulses, oilseeds and some other cash crops.

- (iii) The third important development is the trend towards systematisation and extension of water management and ground water exploration programme. This is being done by the Central Water Board with a view to reduce country's dependence upon the vagaries of the monsoon and to optimise the use of available water in the country.
- (iv) For plant protection and prophylactic measures, a separate Agriculture Aviation Directorate has been set up and Surveillance Team formed.

A National Commission on Agriculture was set up in 1970-71 to enquire into the progress, problems and potential of Indian agriculture. The Commission was asked to examine comprehensively the current progress of agriculture in India and to make recommendations for its improvements and modernisation with a view to promoting the welfare and prosperity of the people. It has produced 22 Interim Reports by March 1975.

Achievements of the Fourth Plan

The Fourth Plan assumed a production level of 98 lakh tonnes in the base year and target was put at 129 m. tonnes, but actual production of foodgrains in 1968-69 turned out to be lower by about 4 m. tonnes. As regards the production level in 1973-74 the total for the country may reach 114 m. tonnes. The performance of individual foodgrains has been extremely uneven, as given in the table below.

Fourth Plan Targets of Production of Foodgrains and Achievement
(In million Tonnes)¹

Crop	Assumed	Targeted	Production during					
	Base Level (1968-69)	Level (1973-74)	1968-69	1969-70	1970-71	1971-72	1972-73	1973-74
Rice	39.00	52.00	39.76	40.43	42.22	43.07	38.63	44.0
Wheat	18.00	24.00	18.65	20.09	23.83	26.41	24.92	21.7
Maize	6.20	8.00	5.70	5.67	7.48	5.10	6.21	5.8
Jowar	10.00	15.00	9.89	1.72	8.10	7.72	6.44	9.0
Bajra	5.10	7.00	3.80	5.33	8.03	5.32	3.80	7.5
Other cereals	7.20	8.00	5.88	5.77	6.94	6.46	5.71	5.0
Pulses	12.50	15.00	10.42	11.69	11.82	10.09	9.49	10.0
Total Food-grains	98.00	129.00	94.00	99.50	108.42	105.17	95.20	104.6
Sugarcane	120.00	150.00	124.68	135.02	126.37	115.38	126.00	144.3
Oilseeds (Lakh Tonnes)	85.00	105.00	68.44	77.34	92.58	82.76	70.00	88.5
Cotton*	60.00	80.00	51.44	52.55	44.99	65.64	54.89	63.1
Jute*	62.00	74.00	29.31	56.53	49.38	56.84	48.69	62.2

1. *Draft Fifth Plan*, Vol. II, pp. 46-47.

Out of a total increase of 31 m. tonnes that was envisaged, 21 m. tonnes of foodgrains was predicted on the success of high-yielding varieties programme. Though the over all progress in coverage of area by high-yielding varieties has been satisfactory, it has not been uniform for all crops.

*Fourth Plan Targets and Achievement of High
Yielding Varieties (m. hectares)*

Crop	Fourth Plan						
	1968-69	Target	1969-70	Area 1970-71	Coverage 1971-72	1972-73	1973-74
Rice	2.60	10.00	4.34	5.59	7.41	8.64	9.7
Wheat	4.80	7.70	4.92	6.48	7.86	10.20	10.9
Maize	0.40	1.20	0.42	0.46	0.44	0.50	0.80
Jowar	0.70	3.20	0.50	0.80	0.69	0.90	1.20
Bajra	0.70	2.80	1.16	2.05	1.77	2.15	3.30
Total	9.20	25.00	11.40	15.38	18.17	22.53	25.90

In case of commercial crops, the shortfall was due to several factors—such as the lack of irrigation facilities, insignificant breakthrough in varietal improvement of oilseeds and groundnut, inadequate supply of needed credit, and the vagary of monsoons.

As against the target of consumption of 55 lakh tonnes of chemical fertilizers, the actual consumption was only of 30.00 lakh tonnes : •N : 19.70 lakh tonnes : P_2O_5 : 620 lakh tonnes and K_2O : 4.10 lakh tonnes—as against targets of 32.00, 14.0 and 9.0 lakh tonnes.

Soil conservation programmes could be undertaken on about 6.4 m. hectares of land, against a target of 5.84 m. hectares of agricultural land. In catchment areas 0.48 m. hectares could be treated with such programmes as against a target of 0.60 m. hectares. Plant protection measures could be adopted on 64 m. hectares (target 80 m. hectares).

The production of fish was 22.69 lakh tonnes in 1973-74 (as against a target of 24.10 lakh tonnes). The milk production was of the order of 23.20 m. tonnes (target 25.86 m. tonnes) : eggs 7700 millions (target 8,800) millions) and wool producing, 30.10 m. kgs. (target 41.50 m. kgs).

By the end of 1973-74, it was estimated that of the total arable area of 175 m. hectares, about 142 m. hectares would be under cultivation, and the gross cropped area would be about 169 m. hectares. Of this 107 m. hectares could be irrigated from surface and ground water sources, their contribution being 72 and 35 m. hectares respectively.

In the field of forestry, the achievement was expected to be of this order : quick-growing plantation species, 251,000 hectares ; economic and commercial plantations, 28,9000 hectares, farm forestry, 80,000 hectares and forest communications, 8,000 kms. against the target of 287,000 ; 339,000 and 75,000 hectares and 11,000 kms. respectively.

AGRICULTURE UNDER THE FIFTH PLAN (1974-79)

The Draft Outline of the Fifth Five Year Plan has set two strategic goals, viz., removal of poverty and attainment of economic self-reliance. The guiding principles were : (i) speedy completion of projects ; (ii) full utilization of capacities and potentials already created ; (iii) achievement of the inescapable minimum targets of additional capacity in the core sector, and (iv) attainment of certain minimum of levels of development for the economically weaker sections.

The Plan provides for a total outlay of Rs. 53.411 crores (Rs. 37,250 crores in the public sector and Rs. 16.101 crores in the private sector). Of the total public sector amount Rs. 4730 crores or 20.1% of the total out lay would be on agriculture.

The main targets of crop production were conceived for the 5 year period as a whole. The annual growth rate in agriculture was expected to be 4.2% per annum, as against 3.9% during the Fourth Plan period. The targets of production are :

Targets of Crop Production¹

Crop	Unit	Anticipated production for five years of Fourth Plan	Targets for 5 years of Fifth Plan	Assumed base level (1973-74)	Peak Targeted production (1978-79)
Rice	m. tonnes	208.0	254.0	44.0	54.0
Wheat	"	126.0	168.0	30.0	38.0
Maize	"	30.0	37.0	6.8	8.0
Jowar	"	42.0	51.0	9.5	11.0
Bajra	"	30.0	37.0	6.5	8.0
Other Cereals	"	29.0	33.0	6.0	7.0
Pulses	"	55.0	65.0	11.5	14.0
Total Food-grains	"	520.0	645.0	114.4	140.0
Oilseeds	"	41.5	55.0	9.4	12.5
Sugarcane	"	735.0	775.0	134.0	170.0
Cotton Lakh bales	"	281.0	360.0	65.0	80.0
Jute & mesta	"	020.0	360.0	67.0	77.0

1. *Draft Fifth Plan, 1974-79, Vol. II, p. 6.*

An increase of nearly 11 m. hectares of gross cropped area is projected, raising the total from about 169 m. hectares (1973-74) to about m. hectares.

For achieving additional growth in crop yields, a multi-pronged effort on the following lines was envisaged : (i) intensification of problem-oriented research ; (ii) expansion of the programme of multiplication and distribution of certified seeds ; (iii) strengthening of agricultural extension and administration ; (iv) increase in the consumption of chemical fertilizers ; (v) water management ; (vi) expansion in institutional credit ; (vii) development of post-harvest facilities and marketing of crops ; (viii) substantial expansion of storage to support marketing infrastructure ; (ix) execution of land reforms.

The strategy of agricultural production during the Fifth Plan period was envisaged as : (i) to apply dry farming techniques on a large scale ; (ii) to extend the high-yielding varieties in the irrigated command ; (iii) to implement a large programme of integrated development of irrigation commands in 50 major irrigation projects covering 14 m. hectares. Other important aspects are : Jhum prevention and proper land utilization of the Jhum land ; reclaiming and developing ravines ; amelioration of alkaline and saline soil and improving the agriculture thereon and rehabilitation of desert land.

Target of Selected Physical Programmes'

Item	Unit	1973-74 (anticipated)	1978-79 (Targets)
1. Area Under High Yielding Varieties ;			
Paddy	m. hectares	9.50	16.50
Wheat	"	10.80	15.00
Maize	"	0.60	1.00
Jowar	"	1.10	2.50
Bajra	"	3.00	5.00
Total	"	25.00	40.00
2. Consumption of Chemical fertilizers			
Nitrogen	m. tonnes	1.97	5.20
Phosphatic	"	0.62	1.80
Potassic	"	0.41	1.00
3. Consumption of Pesticides	tonnes	40.00	74.00
4. Soil Conservation	m. hectares	15.00	25.00
5. Major and medium Irrigation (utilization level)	m. hectares	19.6	24.8

1. *Draft Fifth Five Year Plan, 1974-79, Vol. II, pp. 8, 30, 36 & 38.*

6. Minor irrigation	m. hectares	23.5	29.5
Animal Husbandry			
7. Eggs	m. number	7,700	12,440
8. Milk	m. tonnes	23.20	28.60
9. Wool	m. kgs.	30.10	34.30
10. Liquid milk plant	nos.	90	154
11. Milk product factories (including Creameries)	nos.	18	52
12. Rural dairy centres	nos.	52	132
13. Wool grading & marketing centres	„	13	32
14. Sheep development project	„	1	25
15. Exotic cattle breeding farms	nos.	25	35
Fisheries			
16. Fish	Lakh tonnes	29.69	30.80
Inland	„	7.84	10.55
Marine	„	14.85	20.25
17. Mechanised boats in operation	nos.	9,300	13,300
18. Large fishing vessels	„	100	300
19. Refrigerated rail vans	„	12	53
20. Spawn	million	1,888	4,257
21. Fry and fingerlings	„	483	1,215
22. Nursery area	hectares	923	1,780
Forestry			
23. Plantation of quick growing Species	000 hectares	510	860
24. Economic and Commercial plantations	„	850	1,610
25. Farm forestry	„	80	160
26. Communications	000 kms.	45	60
27. Production of industrial wood	million m.	94	12.3
28. Mixed plantations including fuel wood	000 hectares	140	940
29. Plantations on lands along roads, canal banks railway lines, etc.	000 kms.	not known	32

It may be noted that the agricultural sector has come increasingly under influence of economic planning since 1951-52. Agricultural production, therefore, is no longer seen as an operation limited to the farmer alone. but as a function of the farmer, the

government, the financing institutions, input manufactures, and processors. The important role assigned to agriculture in the planned economy is no accident but it reflects the crucial role it plays in the national economy, contributing as it does, to a little less than half of the net national production of the country. An increasing amount has been allocated (in the public sector) on agriculture development, ranging from Rs. 2,900 million in First Plan to Rs. 27,220 million in the Fourth Plan and to Rs. 47,300 million in the Fifth Plan, i.e., 14% of the total outlay was devoted to agriculture during the First Plan, 17.1% during the Fourth Plan and 20.1% during the Fifth Plan. In addition, private investment in agriculture is estimated at over Rs. 30,000 millions during the period from 1951-52 to 1970-71. During 1978-79, the private sector's contribution would be of the order of 20,500 million.

The major objectives of agricultural development in India's successive Five Year Plans have been :

- (a) To achieve self-sufficiency in foodgrains.
- (b) To increase agricultural production to meet the needs of growing industries and exports to earn foreign exchange for accelerating industrial development.
- (c) To diversify the rural economy with stress on animal husbandry, dairying, fisheries, and social forestry ; and
- (d) To improve the levels of living of the farming community (including small cultivators, the farmer in dry areas and the agricultural labourer) who form the bulk of the population.

Accordingly, the emphasis on "Growth with stability" has subsequently been strengthened and expanded to "Growth with social justice." Priority programmes of development in agriculture have been broadly categorised into : (a) those which aim at maximising production ; and (b) those which aim at remedying imbalances.

Difficulties in Agricultural Planning

There are great hurdles in making agricultural planning a complete success in India. These difficulties may be enumerated as follows :

Firstly, the Indian peasant, whose willing and active co-operation is needed for making the plan effective, is usually conservative and takes a traditional view to the things and is not prepared to adopt new ways. "Participation of the people to framing and fulfilling programmes and targets constitutes the crux of development in the field of agriculture and for the promotion of social welfare. From every aspect agricultural development turns upon the extent to which the people take up programmes with enthusiasm and are willing to work for them."

Hence, in order to take benefit of the active co-operation of the peasant it is necessary that (i) he should be convinced of the soundness of the plan and of the fact that it is in his interest and benefit, (ii) confidence should be inspired in him by producing quick results which he can see and realise ; and (iii) the man in the street should be convinced of the honesty and efficiency of the official in charge of enforcing the plan. The Planning Commission has rightly observed : "If at the level at which the citizen meets the administration, he encounters corruption, delay and inefficiency and if he finds no sign of effective steps against the anti-social elements who exploit the community and benefit themselves at its expense, it will become difficult or evoke enthusiasm and active support from the people."

Secondly, the success of agricultural planning depends on the efficiency and honesty of official and the efficacy of the organisation set up to execute plans. As the Planning Commission points out, "The pace of development will depend largely upon the quality of public administration, the efficacy with which it works and the co-operation which it evokes." There is paucity of trained, efficient and honest officials to make the plans. Unfortunately cases have come to light when the officials concerned have made only paper entries, and instead of passing seeds, manure and money to the cultivator, have pocketed themselves. This short circuits any effort at planning and also destroys the common man's faith in it.

Hence, in order to remove these defects and to select better types of persons for manning the various projects under the plans the Planning Commission has suggested these measures—:

(i) Some machinery should be devised in order to enquire into cases of alleged misconduct on the part of persons who hold any office, political, or other. Where there is a *prima facie* case for an enquiry, such an enquiry should be held in order to find out and establish facts :

(ii) The existing law provides for cases in which a public servant may be found to have come into possession of pecuniary resources of income which he cannot account for satisfactorily. It does not provide for those cases in which a public servant's near relations may have been found to have become suddenly rich. We suggest that the possibility of removing this lacuna should be studied and necessary legislation undertaken ; and

(iii) An official who does not have a reputation for honesty should not be placed in a position in which there is considerable scope for discretion.

Thirdly, agricultural planning is hampered by the peculiar character of Indian rural life. There is a lack of suitable roads, irrigation and other infrastructure facilities. These must be provided in the rural area without delay if the plans are to be made effective and fruitful.

Fourthly, it has been noticed that the efforts of various agencies at different levels in relation to agricultural production were not being effectively co-ordinated. Consequently, implementation of different programmes was being adversely affected.

To secure necessary co-ordination at the State level, the State Governments have set up Agricultural Production Committees at the Cabinet and Secretariat levels to streamline the efforts of the Departments of Agriculture, C. D., Panchayats, Co-operation, Irrigation and other departments whose activities have a bearing on the development of agricultural production. Besides, V. L. W. which is the primary extension agency for agricultural development, has been given only one set of tasks viz., those connected with agricultural production.

In order to overcome the difficulties inherent in the agricultural economy, the State must intervene and accept the responsibility for including changes through positive programmes. These programmes, providing for a dynamic element of social uplift, should aim at an appreciable increase in the physical output per acre of land, less input per unit of product, and a higher yield per unit of labour.

The programmes should take several forms, especially the following :

(1) the creation of social capital, through extension of irrigation and power, the reclamation of virgin or barren lands, the improvement in, and expansion of the means of transport.

(2) the organisation and wider application of agricultural research and scientific farming.

(3) the provision for improved technology, plant breeding. improvement of livestock, weed and pest control.

(4) the distribution of improved seeds, fertilizers, implements and manures should be speeded up. The programme for establishing State seed farms for raising nucleus seeds and multiplying these through registered growers for wider spread through sale or exchange should be implemented on a priority basis.

(5) the encouragement of farm mechanization through State tractorisation services as in West Bengal, U. P., M. P. or on a co-operative basis as in the Scandinavian countries.

(6) an adequate provision of rural credit should be made. Agricultural credit should be linked with production programmes worked out on a village and family basis.

(7) the organisation of warehousing, grading of farm produce and agricultural marketing.

(8) education and health services in rural areas, uplift of the backward classes and assistance to the under-privileged sections of the rural communities.

(9) agricultural extension service to promote self-help and mutual co-operation and to guide or spread the knowledge of better farming techniques, and

(10) afforestation and soil conservation measures.

It is the rate of investment in social capital and the promotion or expansion of scientific farming that can engender the speed of technological change in agriculture so as to produce full employment in farm occupation, to diversify the rural economy and to rationalise the input-output ratios in production.

In formulating and implementing programmes for the development of agriculture and the rural economy the guiding principle should be that whatever is physically possible should be made financially possible and the potential of each area should be developed to the utmost extent possible. The Ford Foundation Team was so confident that it observed, "It is within the capacity of India's people to mobilize to meet the great crisis before them."

AGRICULTURE UNDER FIVE YEAR PLAN

(1978-83)

The main approach in the Five Year Plan will be growth for social justice, achievement of full employment in the rural areas in a period of 10 years and removal of poverty. Besides, the aim is to create surplus and promote exports in respect of certain commodities.

India's food production increased by a compound growth rate of 2.8 per cent during the 25 years period from 1951-1975. During the last 25-30 years, the country has been able to increase production by about 50 to 60 per cent. But future task is more tremendous, in as much as, to feed 900 million, the country will be required to produce about 230 million tonnes of food grain as against the present level of 115 m. tonnes, which implies that production has to be doubled by the end of this century.

The Five Year Plan, therefore, has set the over-all rate of growth for the agricultural sector at 3.98 per cent so that the food-grains production of 140.48 million tonnes, 188 m. tonnes of sugarcane, 81.50 to 92.5 lakh bales of raw cotton, 85.60 lakh bales of raw jute and mesta and 113 to 115 m. tonnes of oilseeds during 1978-83 could be possible of achievement. This level of production will provide self-sufficiency in major agricultural commodities. Compared with the growth rate of 3.61 per cent for food grains the rate of growth for the agricultural output would be 3.98 per cent. That of milk and milk products, 5.23 per cent, other animal husbandry activities 4.01 per cent; forestry and logging 8.92 per cent and fishing 4.06 per cent.

The main strategy to attain the required production levels would comprise, among others, increases in irrigation, gross-cropped

area and cropping intensity, as well as a larger application of inputs. Emphasis would also be placed on improving the rainfed farming to bring about greater stability in production and increase in productivity.

The strategy for securing a rapid increase in various inputs for production would be supported by inputs of science and technology, assured availability of credit, a strong extension network and facilities for marketing, storage and processing. Suitable linkages would be developed and strengthened with other infrastructure systems, viz., lower transport and communication, for processing and marketing of the produce.

To achieve a rapid growth of output and employment, the outlay envisaged during the Plan period have been proposed at Rs. 18,250 crores as against Rs. 8,528 crores for the Fifth Plans Institutional finance will play an active role as a major supplementary source of financing of agricultural development.

The targets of production for agricultural sector during the Plan period, have been fixed as below :

Targets of Agricultural Production

Item	Unit	Likely level of production in 1977-78	Target-for 1982-83
1. Gross Irrigated area	m. ha.	48.41	63.41
2. Gross cropped area	m. ha.	173.92	180.03
3. Total food grains	m. tonnes	121.00	140.48
4. Sugarcane	do	156.90	188.00
5. Cotton	lakh bales of 170 kgs. each	64.30	92.50
6. Raw jute and mesta	lakh bales of 180 kgs. each	67.60	86.92
7. Oilseeds	lakh tonnes	100.00	124.54
8. Milk and milk production	m. tonnes	27.50	35.00
9. Eggs	m. (nos.)	102.00	16.000
10. Wool	m. kg.	31.00	38.00
11. Fisheries	lakh tonnes	25.00	34.00
12. Inland	do	9.00	12.00
13. Marine	do	16.00	22.00

During the Plan period a more equitable distribution of land resources, through programmes of land reforms, will be implemented more vigorously. For this purpose, it will be necessary to ensure that :

- (i) the land declared surplus to the ceiling is taken over by the State ;
- (ii) it is distributed and physically delivered to the eligible categories expeditiously ;
- (iii) the land records are mutated to reflect their rights ; and
- (iv) the allottees are given adequate financial, material and technical assistance to bring the land under productive cultivation.

Land records would be updated ; the gross irrigated area will increase from 48.41 m. hectares to 63.41 m. hectares. The food-grains production will increase from 121.0 m. tonnes to 144.08 m. tonnes. This additional increase is contemplated in respect of some of the important inputs thus :

(i) irrigation potential 17 m. hectares ; gross cropped area 7 m. hectares ; high yielding varieties for foodgrains, 15 m. hectares and consumption of chemical fertilizers 3.6 m. tonnes. The demand for fertilizers has been placed at 7.8 m. tonnes.

Soil conservation measures and afforestation measures will be taken in the catchment areas of all main rivers which create flood havoc.

Quality seeds will be made available, an increasing scale by the National Seed Corporation, and the State Seeds Corporations.

The demand of milk is projected to be 42.95 m. tonnes in 1982-83. With the launching of the project "Operations Flood II" the supply base of milk will be widened, so that the availability of milk per capita per annum would increase to 45.62 kgs, from 39.01 kgs.

The execution of "operations flood II" would require larger supplies of cattle feed and fodder. The demand has been placed at 348.14 m. tonnes of dry fodder, 452.72 m. tonnes of green fodder, and 34.75 m. tonnes of concentrates. This will need an area of 8.45 m. hectares.

The Plan outlay, in the public sector, on agriculture and rural development, will be as follows :

Plan Outlay

(in crores of rupees)

Sector	Fifth Plan 1974-79	Five Year Plan 1978-83
I. Agriculture and allied activities	3,109	5,800
1. Agricultural		
2. Research and Ed.	210	425
3. Agricultural Production Land Reforms & Consolidation of holdings	575	1,125
	163	350

4. Soil Conservation & Land reclamation measures	221	450
5. Animal husbandry and dairying	438	825
6. Fisheries	150	400
7. Forestry	206	450
8. Investment in agricultural financial institutions	520	1,000
9. C. D. and Panchayti Raj	1,327	150
10. Co-operation	176	475
II Rural Development	1,193	2,800
1. Special programmes for rural development.	537	1,550
2. Command Area Development	206	450
3. Hill and Tribal Area Development	450	500
III Irrigation and Food Control	4,226	9,650
1. Major and medium irrigation	3,089	7,250
2. Minor irrigation	792	1,725
3. Flood Control	345	675
Grand Total	8,528	18,250

In sum, the broad strategy under the agricultural production will be to develop irrigation as rapidly as possible and optimally utilise land and water as well as other local resources in a coordinated manner. For this a comprehensive area development approach would be adopted with special attention to the poorer sections in the rural areas. Mixed farming would be promoted extensively as a means of increasing investment, employment and income per unit of land and integrating crop production, animal husbandry, forestry and fisheries. The development policy will lay emphasis on the production of foods of higher nutritive value with a view to increasing the nutrition and health of the rural population. The comprehensive approach would incorporate elements. Such as technology, institutions and services, which are required for improved and modernised agriculture.

New Agricultural Strategy or Green Revolution

Genesis of the New Strategy

Though as a result of launching of the First and Second Plans, foodgrains production in absolute terms did show improvement, despite year to year fluctuations, yet the development efforts were not dovetailed with natural factors, the most important of them being weather fluctuations, which rendered development measures less effective. In addition to adverse weather conditions a large number of other factors also affected foodgrains production, such as :

(i) dispersal of the limited available resources over a very wide area which could not exert appreciable impact on the productivity of agricultural land ; (ii) unconformity of the State Plans with the targets laid down by the Planning Commission ; (iii) lack of organisation of the country-wide productivity movement in agriculture ; (iv) non-availability of the adequate inputs particularly fertilizers ; (v) lack of concerted actions on the part of the Government, to develop irrigation facilities through major, minor and medium works; and whatever works were put into operation, they were affected by time-lag and suffered from a number of bottlenecks ; (vi) under-utilization of the existing minor irrigation facilities and lack of effective steps, on the part of the Government to set up a suitable machinery to ensure maximum utilization ; (vii) lack of support by the Rural Electrification Corporation to irrigation project. Power was not earmarked for rural use –the guiding principles being for the selection of villages for electrification, were remunerativeness, nearness to main transmission line, population and accessibility ; (viii) uniformity of land-use pattern in irrigation and unirrigated areas ; (ix) half-hearted or insufficient implementation of land reform measures ; (x) small investment in industries producing agricultural inputs ; (xi) the traditional, conservative and rigid administration pattern of the agricultural departments, which failed to accept the challenges of the situation and their approach could neither inspire the farmers nor accelerate the process of development of agriculture : and (xii) non-adoption of recommended practices by the farmers as these did not fit in the local situation on needs.

As a result of these factors, not only agricultural production did not keep pace with rapidly rising population but the calorific content in diet also deteriorated, inasmuch as 70 to 80 p. c. of the calories in the diet of people was contributed by foodgrains alone. This needed diversification in agricultural production to provide adequate proportion of calories from vegetables, fruits and animal products. This necessitated a change over the land use pattern.

It was in this context that the Agricultural Production Team, sponsored by the Ford Foundation was invited by the Govt. of India in 1959. It observed that "the entire nation must be made aware of the impending food situation and steps must be taken to meet it on a war footing. For this, allocation of the necessary resources and hard work, zeal, enthusiasm and sacrifice on the part of all those who are engaged in it are needed."¹ One of the important recommendations of the team was that "instead of spreading the developmental efforts more or less on uniform basis throughout the country without getting any striking results, intensive efforts for production should be undertaken with a combination of all the technological improvements and concentration of manpower and resources in selected areas which had optimum conditions for stepping production, without at the same time affecting the normal efforts in other areas which had optimum conditions for stepping production, without at the same time affecting the normal efforts in other areas."²

These recommendations were examined first by the Inter-Ministries Committee of the Central Govt. and then by a second team of Agricultural experts of the Ford Foundation ; and final shape was given to these recommendations in the form of "*Ten Point Pilot Programme to Increase Food Production*". These ten points included ; (1) adequate and readily accessible farm supplies ; (2) adequate farm credit ; (3) an intensive educational programme ; (4) simple individual farm plans ; (5) stronger village institutions ; (6) assured prices for agricultural products ; (7) reliable marketing facilities ; (8) rural public works ; (9) evaluation and analysis ; and (10) a coordinated approach.

This programme has four-fold purposes of : (a) determining how rapid increases in food production could be achieved as to provide experience for adoption in other areas ; (b) increasing the income of the cultivator and his family ; (c) helping to improve the economic resources of the village ; and (d) providing an adequate agricultural base for more rapid economic development and social betterment. In other words, the programme aimed at providing adequate incentives and aids to cultivators to increase production through the intensive application of all resources and requisites in the selected districts. The programme was based on selective approach.

1. *Report on India's Food Crisis and Steps to Meet It*, 1959, pp. 11-14.

2. *Ibid.*, p. 14.

Intensive Agricultural District Programme

The outline of the programme, known as *Intensive Agricultural District Programme* (IADP) a *Package Programme* was chalked out in 1959 and put into action during 1960-61. It aimed at an integrated and intensified approach to the problem of agricultural production in areas which were more responsive to such production efforts. The immediate goal was to achieve rapid increase in the level of agricultural production through a concentration of financial, technical, extension and administrative resources. The long run goal was to create a self-generating break-through in productivity and raising the production potential by stimulating human and physical process of change. Its another goal was to demonstrate the most effective ways of increasing production and providing lessons for extending such intensified agricultural production programmes to other areas.

Initially the IADP was introduced in seven states (4 were rice producing : Andhra; Bihar, Tamil Nadu and M. P., 2 were wheat producing : Punjab and U. P. and 1 millet producing : Rajasthan) where there was one project at each place. The selection of these places was made on these criteria : (a) the district should as far as possible, have assured water supply ; (b) it should have a minimum of natural hazards, like floods, drainage problems, acute soil conservation problems ; (c) it should, as far as possible, have well developed village institutions, like cooperatives and Panchayats ; (d) it should have maximum potentialities for increasing agricultural production within a comparatively short time ; (e) it should be compact, as far as possible, to ensure better administration and supervision. Later on, during 1962-63 and 1963-64, 8 more places were selected in eight districts ; besides six blocks in the state of Jammu and Kashmir. Thus there were in all 16 districts in which IADP is in vogue :

Place	State	Year of Launching the programme
1. Tanjavur	Tamil Nadu	Kharif, 1960-61
2. West Godavari	Andhra Pradesh	Kharif, 1960-61
3. Shahabad	Bihar	Rabi, 1960-61
4. Ludhiana	Punjab	Kharif, 1961-62
5. Pali	Rajasthan	do
6. Aligarh	U.P.	do
7. Raipur	M.P.	do
8. Alleppy	Kerala	Kharif, 1962-63
9. Palghat	do	do
10. Maudya	Karnataka	Rabi, 1962-63
11. Surat	Gujarat	do
12. Sambalpur	Orissa	do
13. Bhandara	Maharashtra	Kharif, 1963-64
14. Cachar	Assam	do
15. Burdwan	W. Bengal	do
16. Jammu & Kashmir		do

The main objectives of the IADP have been

(1) To find and show a way of spectacular increase in the productivity of agricultural land by using modern technology ;

(2) To identify the methods of effecting changes in the farmer's attitudes with a view to motivating them to adopt improved production practices ;

(3) To develop package of practices in collaboration with the research resources available in the country ;

(4) To evolve an administrative pattern at district level that would implement the agricultural development programmes more effectively in a well co-ordinated and integrated manner.

The IADP has been considered a more rational, pragmatic and impactful programme than other programmes undertaken earlier. The earlier programmes were not tailored according to the needs of the farmers and the farms. *Secondly*, individual programmes were directed to one direction and technique without coherent relationship with producers and agencies which were involved in the programme. *Thirdly*, administration and institutions developed to support the farmers, were not oriented and geared to the problems and needs of the farmers. As against these, the whole programme of IADP is farmer-oriented and farm-centred.

The IADP is involved in (i) *on-the farm activities*, such as field demonstrations, introduction of pack practices, crop cutting evaluations, water use, and management ; and (ii) *off-the farm activities*, comprising arranging for adequate supply of farm inputs, credit, marketing of farm surpluses, transport, farm planning, establishment soil testing laboratories and implement workshops, strengthening of village institutions, farmers training and education etc.

The IADP pace of coverage was somewhat slow upto 1962-63 but it gathered momentum since 1963-64 ; by 1967-68 it covered 13 lakh cultivating families in 25,639 villages : and affected 32 lakh hectares of cultivated land (out of a total of 211.27 lakh hectares). Initially the package of improved practices was applied to important key crops, later on emphasis was given on other aspects too such as proper placement of fertilizers, introducing changes in the timing of sowing and other tillage and inter-cultural practices. The production of foodgrains increased substantially in IADP districts. During 1960-65, in the first group of 7 districts, in Aligarh and Ludhiana, the wheat yield increased by 55 per cent and 95 per cent over the pre-package period. In the second group of 8 districts, there was an increase of 64 per cent in Mandya districts, while in the rest it was modest.

The evaluation of IADP has been done by the Experts Committees, and according to these¹ (1) The basic concept of the programme has proved to be sound. It has demonstrated a significant new approach for modernising nations agriculture. (2) The Indian farmer has shed his timidity in adopting the tried methods. He is not un-intelligent and unduly tradition bound. (3) The IADP has proved that the smaller farmer can be as progressive as the big farmer, especially in the adoption of improved practices. (4) The existing administrative system was not equipped for the job and had to be geared to the needs of the programme, (5) The Government's basic policy regarding credit, marketing, prices, industries, investment and land were not conducive to the full realisation of the benefits of the impact of IADP. (6) Programmes of agricultural development such as IADP involved, in the ultimate analysis, rather drastic changes in traditional thinking of a very large number of rural people have to be motivated to adopt new and improved practices to crop production.

The Expert Committee on IADP in its Second Report concluded that the IADP has been a 'path-finder' for successful programme. However, it hinted at improvement in these areas : (a) providing a better over-all economic climate to encourage farmers ; (b) strengthening and stabilising the staff situation in the district, so that they can be more effective ; (c) ensuring adequate supplies of technical inputs and production credit and improving distribution policy and local management of irrigation water ; and (d) speeding up the development of high yielding, disease-resistant crop varieties of all major crops.

Intensive Agricultural Area Programme

The observation of the Mid-term Appraisal of the Third Five-Year Plan that "much greater emphasis should be given to the development of scientific and progressive agriculture in an intensive manner in areas where a high agricultural production potential exists ;" the growing needs of more food grains, and the experience gained from the working of the IADP led the Agricultural Food Production Board (of the Ministry of Food and Agriculture) to decide and formulate a programme under the name of *Intensive Agricultural Area Programme (IAAP)*, which should cover about 20% to 25% of the cultivated area of the country, and this area should be selected for intensive agricultural development. IAAP was launched in 1964-65 for the intensive development of import crops, such as wheat, paddy, millets, cotton, sugarcane, potato, pulses. etc. in 114 selected districts.

The aim of IAAP was to bring about a progressive increase in the production of main crops in selected areas by an intensive "Package Approach" i. e., the use of inter-related factors—physical,

1. Second Report of the Expert Committee on Assessment And Evaluation of I A D P, p. 12 ; *Ibid Fourth Report*, p. 9.

social and institutional-in strategic combination, which were likely to exert an impact on agricultural production. It is based on the fact that earlier planning was defective because of the policy of dispersing resources to many schemes over too wide an area.

In 1964-65, 114 districts and 1084 blocks were selected. In 1965-66, 597 blocks and in 1966-67, 910 blocks were selected. The total area covered under the Programme in these blocks during 1964-65 was about 90 lakh hectares and during 1966-67, it increased to 133 lakh hectares. About 20 lakh cultivating families participated in the Programme in these states during 1964-65 and 31 lakh during 1965-66.

The number of IAAP districts was quite large accounting for sizeable cultivated area. The limited supplies of the inputs had been an important limiting factor in the progress of IAAP. Besides, the inadequacy of the technical staff was another inhibiting factor.

While both the IADP and IAAP were concerned without promotion of intensive agriculture, they operated within the limitation set by existing crop varieties which had relatively low response to fertilizers. Further, the two unprecedented droughts in 1965-66 and 1966-67, and the biological revolution brought about by the introduction of new strains of various foodgrains, necessitated the embarkment on a new strategy of agricultural development in 1966-67. *The key note of this strategy is the application of science and technology for increasing yield per hectare. This strategy, known as New Agricultural Strategy or Green Revolution* (because it created greener looking fields) is based on the extension of high yielding varieties responsive to heavy doses of fertilizers and the package of improved practices in selected areas with assured rainfall or irrigation facilities.

The programmes included under the new strategy are :

1. The High Yielding Varieties Programmes (H. Y. V. P.)
2. Multiple Cropping Programme (M. C. P.)
3. Integrated Development of Dry Areas (IDDP)
4. Plant Protection Measures
5. Increased Use of Fertilizers
6. New Irrigation Concept
7. Water Management

1. The High Yielding Programme

This programme was launched in the kharif season of 1966 in selected areas having assured rainfall. It envisaged popularisation of the high yielding varieties of paddy, wheat, maize, jowar and bajra over fairly large areas.

The Programme covered 1.99 m. hectares under high-yielding varieties in 1966-67. The coverage increased to 6.04 m. hectares in 1967-68 ; to 9.29 m. hectares in 1968-69 ; to 11.41 m. hectares in 1969-70. In 1970-71, it was 15.8 m. hectares. The target of coverage under the Fourth Plan was 25 m. hectares. As against this, the achievement of H. Y. V. P. crop-wise has been of the following order.¹

	1968-69	1967-68	1970-71	1971-72	1972-73	1973-74	1974-75	1975-76	1976-77	1977-78 (Target)
Rice	2.68	4.34	5.6	7.4	8.1	9.2	10.8	12.7	13.7	15.0
Wheat	4.79	4.91	6.5	7.9	10.0	11.0	81.3	13.5	14.7	14.0
Maize	0.39	0.45	0.5	0.4	0.6	0.9	1.1	1.1	1.2	7.3
Jowar	0.69	0.55	0.8	0.7	0.9	2.2	1.3	2.0	2.7	3.0
Bajra	0.74	1.16	2.1	1.8	2.5	3.0	2.5	2.9	2.2	2.7
Total	9.29	11.42	51.4	18.2	22.1	26.0	27.0	32.2	24.5	37.0

The H. Y. V. P. has been taken up for five crops. Among these the most striking success has been achieved in wheat. The average yield of wheat has been 1300 kgs per hectare. With high yielding strains (Kalyan Sona, Sonalika, Safed Lerma, Choti Lerma, Sharbati Sonara and triple Dwarf varieties like Hira and Moti), the yields have been exceptionally high (over 2000 kg), very high (1801-2200 kg) and high (No 1-11800 kg) in Punjab, Haryana western U. P. Plains, and northern parts of Gujarat plain. Elsewhere the yields have been low. The major factor which triggered the wheat revolution in Sutlej-Yamuna plain was the introduction of high yielding, nitrogen-responsive dwarf-strains of wheat from Mexico : as well as the human element i.e. the efficient and innovation-minded group of farmers familiar with irrigated wheat culture.

The production yields in other crops have been rather low. As against the average yield of 1150 kgs of paddy per hectare, it increased to 1651-2050 kgs and 1251-1650 kgs. per hectare in the core rice regions. The yield increased due to the increasing-area under improved strains (such as Taichung Natiri 1, Taichung 65, Taiwan 3, ADT-27, IR-8 ; Padma, Jaya, Hansa, Pankaj, Jagannath ; Sabarmati ; Jamuna, Bala, Krishna, Ratna, IR-20 and Kaveri 7,) plant pest control, the introduction of intensive Japanese method of cultivation and the greatly increased use of artificial fertilizers. Further, mini-kit-programme for increasing rice production was launched under which pre-release varieties of rice is tested as the farmers fields.

Productivity of jowar did not show any appreciable increase. The national average was 470 kgs. In case of bajra, the national

1. Ministry of Agriculture and Irrigation, *Annual Report for 1970-71*, p. 26 ; *Fourth Five Year Plan*, p. 122 ; and *Report on Currency and Finance* Vol. 1, 1974-75, p. 24, *Economic Survey for 1977-78* p. 67.

average was 685 kgs. per hectare, it increased to as high as 1000 kgs. (in Punjab, Haryana, Gujarat, Tamil Nadu and A. P.) to over 2000 kgs. on the sandy soils of marusthali. It has been over 2300 kgs per hectare in Ferozepur (Punjab). Average maize productivity has been 1467 kgs per hectare. It increased to over 1550 kgs per hectare due to increased use of improved strains (Ganga 101, Ganga Safed, Ganga-3, Deccan, Ranjit, Hi starch, Him-123).

Technical Characteristics of H. Y. V. P.

One of the basic pre-requisites for the cultivation of H. Y. V. seeds is that the fields in which these are sown should have proper drainage facilities. While irrigation is a pre-condition, controlled irrigation seems to be an essential factor for the successful cultivation of these varieties.

These varieties are said to be highly susceptible to pests, particularly to the gally and to diseases such as bacterial blight. Even slightly abnormal seasonal conditions are said to be favourable for the growth of such pests and diseases.

All varieties are short duration varieties (ranging from 110 to 140 days in different parts). This necessitates the proper synchronization with the existing cropping pattern in the given area so as not to seriously disturb the pattern of cultivation. The high yielding paddy varieties possess poor dormancy.

One of the most crucial characteristics of these high-yielding varieties is that they are all dwarf varieties. It is this feature which is most significant and which had made these varieties responsive to higher doses of fertilizer application, e.g. as against the average dosage of 10 N per hectare for paddy, 5 N for bajra and 10 N for jowar, the H. Y. V. requires 40 to 50 N, 20 N and 30 N per acre respectively.

The H. Y. V. are coarse and hence, the market price is invariably lower than the other medium and finer varieties. Besides, the cooking quality of some of these is said to be poor.

The response to these varieties is reported to be very high under irrigated conditions and therefore cultivation of these can be undertaken in irrigated areas.

Practices such as the use of treated seeds, interculture, prophylactic measures, plant protection, application of recommended doses of fertilizers are all important in order to derive the maximum benefits.

2. Multiple Cropping Programme

This programme envisages that more crops per year per hectare are raised. The total cropped area in 1966-67 was 157 m. hectares, of this double-cropped area was only 20 m. hectares; the gross area irrigated was about 33 m. hectares, but only about 15 p. c. of the

total irrigated area was under double-cropping. Besides, there was found hardly any difference in intensity of cropping in irrigated and unirrigated areas. The cropping intensity of agriculture was much low (115 to 118 p. c.) as compared to that in similar conditions in Pakistan (137 p. c.), Japan (120 p. c.), South Korea (15 p. c.) and Taiwan (180 p. c.). Low intensity of irrigation in certain areas and the use of long duration varieties have been the two principal limiting factors in the adoption of multiple cropping. Opportunities have been available with the introduction of short duration high yielding varieties, to grow 2 or even 3 crops per year in fully irrigated areas and 2 crops in partially irrigated areas, where there used to be only one crop. In irrigated areas, the cropping intensity could also be raised to 200 to 300 p. c.

The basic idea of this strategy has been the development in irrigation ; increased use of fertilizers ; proper adoption of water management practices ; adoption of late sowing and short duration varieties ; adjustment in the time of sowing, planting and harvesting ; introduction of new crops in place or along with traditional crops : and selection of proper rotations can help in raising additional crops both in mono-cropped and double cropped areas.

Taking these facts into consideration, the *Multiple Cropping Programme* was launched during 1967-68. The target then was put at 3 m. hectares over which multiple-cropping was to be done. It was noted that short duration varieties of moong, potato, cowpea, maize, bajra, toria, dwarf rai, and fodder could be grown profitably as the third crop ; and according to the rainfall pattern in different areas, the rotations might include rice, hybrid maize, sorghum, wheat, cotton, groundnut, potato, sugarcane, fodder and legumes. As against the target of 3 m. hectares, the achievement for 1967-68 was placed at 3.64 m. hectares. In area under multiple-cropping increased to 5.53 m. hectares in 1969-70 ; to 7.04 m. hectares in 1970-71 o 14.3 m. hectares in 1972-73 ; and to 16.0 m. hectares in 1973-74.

Multiple cropping programme has special significance for small farmers, who have greater labour resources to work on a unit of land. Intensive multiple cultivation is bound to result in better utilization of family labour and bullock-power resources. Besides increasing the production of foodgrains multiple cropping also results in increasing the income potential of small holdings, improving human nutrition, and improving animal husbandry and thus leading to overall rural prosperity.

The four major scientific ingredients of a multiple cropping system are ; short-duration and photo-insensitive varieties ; (ii) agronomic practices which can maximise the genetic potential for yield ; (iii) co-ordinated strategy of pest and disease control, and (iv) appropriate post-harvest technology. The use of these ingredients is essential for the success of the programme.

Therefore, (a) suitable crop sequence for each agroclimatic zone should first be determined and the meteorological and soil data analysed ; (b) controlled water use and minor irrigation works should be made available ; (c) labour saving devices (i. e. agricultural machines) need be used increasingly, (d) timely and adequate supplies of inputs is a must ; (e) constant research to evolve more suitable varieties; and analysis of field data and problems are other inevitable requirements.

It would be noted that multiple cropping programme is a highly technical programme and needs a scientific approach and well thought out decisions on the part of the cultivators. Planned carefully, supported adequately and implemented properly the programme may go a long way in achieving the targets of self-sufficiency in food productions.

To accelerate the tempo of progress of M. C. P., the Central Government launched a scheme in 1971-72 for implementing 55 pilot projects in IADP, IAAP or SMDA districts, having adequate irrigation and drainage facilities to permit intensive cropping. The object was to establish an integrated action programme of adaptive research, trials, water use and management, scientific demonstrations, well organised extension efforts, streamlined input supplies, credit services and organised marketing and other infra-structural facilities for accelerated development of multiple-cropping in the areas. In other words, a comprehensive package of practices and sources was to be made available to the participating farmers.

During the Fifth Plan period, M. C. P. will be systematised by the co-ordination of surface and ground water exploitation so as to change the cropping pattern in the irrigated areas and add to the gross hectrage.

3. Integrated Development of Dry Areas

An intensive programme known as Integrated Dry Land Agricultural Development, was launched in 1970-71, initially in pilot projects (in Hyderabad ; Rajkot, Hissar; Indore, Sholapur, Bellary, Jodhpur, Tirunelvely and Jhansi). Later on it was introduced in 15 more pilot projects during 1971-74 in Anantpur, Palamau, Kutch, Mohindergarh, Jammu, Rewa, Akola, Hebbel, Bijapur, Udaipur, Bhilwara, Salem, Ghazipur, Agra and Bhubaneshwar. During 1977-78, 24 pilot schemes were in progress. Each project covered an additional area of 800 hectares. The programmes include cultivation of drought resistant, short duration and high yielding varieties of crops with package of practices, land development including land shaping and land levelling, construction of wells, bunds and bundies and distribution of improved farm machinery, seeds, fertilizers and pesticides.

The purpose of this programme has been to develop and extend techniques and undertake measures which are capable of benefiting dry lands. In the country as a whole there are about 128 districts which have low medium rainfall (between 375 mm. and 1125 mm.) annually with limited irrigation facilities. Out of these, 91 districts spread out mainly in A. P., M. P., U. P., Gujarat, Maharashtra, Tamil Nadu, Karnataka and parts of Haryana, constitute typical dry land tracts. The total net area sown in these areas is estimated at 42 m. hectares of which about 5 m. hectares are irrigated. In this tract, the very high intensity dry farming areas (with rainfall varying 575 mm. to 750 mm. and irrigated area below 10 per cent of the cropped area) mainly cover central parts of Rajasthan, Saurashtra region of Gujarat and rain shadow region of Western Ghats of Maharashtra and Karnataka. It is these dry land farming areas which hold good promise of responding to a new package of technology.

The development efforts under this programme involve : (i) land consolidation and soil conservation; (ii) improvements in tillage leading to better soil texture and root penetration; (iii) addition of plant nutrients through deep placement of fertilizers; (iv) adoption of water-harvesting procedures resulting in storing as much as of the moisture as possible for the use of crops; (v) use of improved seeds; (vi) cultivation of draught-resistant and short duration crops; (vii) popularisation of crops like soyabean, wheat, maize, castor, safflower, sunflower, cotton, cashewnuts, oil palm, dates, grasses; (viii) popularisation of multiple cropping programmes, and (ix) genetic upgrading of the non-descript cattle population. Besides, a systematic survey and development of ground water resources is undertaken to further increase the income potential of agriculture in dry areas.

The essential pre-requisite is to encourage land levelling, land shaping, water harvesting and soil conservation practices by way of suitable subsidies and loans to farmers with less than 4 hectares holding. The schemes take care of infra-structure requirements like use of improved seeds, implements, foliar spraying of urea and pesticides, sprinkler irrigation demonstrations and suitable animal husbandry programmes.

Since the implementation of this programme requires careful planning, close co-ordination and continuous supervision and on-going evaluation, some additional staff has been provided for each project.

Under the Fifth Plan, attempts will be made to provide at least a minimum, say 10 per cent, of the cropped area in each district with irrigation support, if possible, by bringing water from another catchment.

The area under dry-farming has increased from 18.1 thousand hectares in 1974-75 to 19.1 thousand hectares in 1975-76 and to 19.2 thousand hectares in 1977-78.

4. Plant Protection Measures

Plant protection forms an important part of increased production. Plant protection programme includes seed treatment, intensive aerial and ground spraying, weed control and rodent control. The total area benefited increased from 16.6 m. hectares in 1965-66 to 48 m. hectares in 1969-70, to 52.0 m. hectares in 1972-73 ; to 60.5 m. hectares in 1973-74 to 64.0 m. hectares in 1974-75 ; to 74.6 m. hectares in 1977-78. Efforts are being made to popularise effective weed control through use of herbicides. For ground and aerial spraying operation 12 surveillance stations are operating at Bilaspur, Cuttack, Deoria, Elluru, Indore, Jullundur, Lucknow, Malda, Pusa, Nizamabad, Tiruchirapalli and Shimoga.

5. Increased Use of Fertilizer

The continuance of high level of soil fertility and its nutritional balance is one of the important means to profitable land use and sustained agricultural production. The optimum and balanced use of fertilizer is, therefore, an indispensable element of the strategy for achieving the objective, particularly with reference to high yielding varieties.

The consumption of fertilizers has been continuously increasing. The consumption of nitrogenous fertilizers increased from 575 thousand tonnes, of phosphatic fertilizers from 132 thousand tonnes and that of potassic fertilizers from 77 thousand tonnes in 1965-66 to 1,479,541 and 236 thousand tonnes in 1970-71 to 2457 ; 635 ; and 319 thousand tonnes in 1976-77 and to 2888, 827 and 469 thousand tonnes in 1977-78.

Not only this, the quality of rural compost produce was of the order of 205 m. tonnes in 1977-78 as against 200 m. tonnes in 1974-75 and 170 m. tonnes in 1973-74. The present coverage of green manuring is estimated at 7 m. hectares. About 5.8 m tonnes of urban compost was available in 1977-78, as against 5.4 m. tonnes in 1976-77. Under the Fifth Five Year Plan, the targets of fertilizer-consumption have been placed at 5200 thousand tonnes of N; 1800 thousand tonnes of $P_2 O_5$ and that of $K_2 O$ at 1000 thousand tonnes.

Consumption of Fertilizers (000 tonnes)¹

Year	Nitrogen	Phosphatic	Potassic	Total
1965-66				
1970-71	1,487	462	228	3,177
1971-72	1,755	564	304	2,623
1972-73	1,779	587	333	2,699

R. B. 1. ; *Report on Currency and Finance*, Vol. 1, 1974-75, p. 25 for 1976-77, p. 23 ; Report of the Department of Agriculture for 1977-78 p. 57.

1973-74	1,829	650	360	2,839
1974-75	1,776	472	336	2,574
1975-76	2,149	467	278	2,894
1976-77	2,414	648	340	3,405
1977-78	2,888	827	469	4,184

6. New Irrigation Concept

In the past, irrigation was mainly developed as protection against drought. Now it is oriented to intensive production. This implies (i) limitation of "Command Area" so that available water can be more effectively used for multiple crops as well as intensive agriculture. For this purpose the C. A. D. Programme has been started in 17 selected Command Areas. Originally during the Fourth Plan period only 10 areas were selected. Schemes in the Command Areas of Purna and Shufranji were sanctioned during 1972 and the remaining commands of Chambel, Gandak, Tungbhandra, Salandi and Sone were taken up since 1973, and of the Chambal and Rajasthan canal in 1974, the Pochamped C.A.D. in 1976 ; Jaykwadi-purva and Perigar-Vagai in 1977.

Besides, in order to make best utilization of the available water resources, field channels, and water courses are constructed. Land levelling, and land shaping and other on-farm works, and provision of proper drainage systems and supply of requisite infrastructure facilities and inputs are also provided.

By end of December 1977, 37 C. A. D. Authorities covering 47 irrigation commands in 12 states were functioning, 14.26 lakh hectares of land was planned and designed, 92,205 kms field channels constructed, 17,634 kms. of field drains were completed and 7.80 lakh hectares levelled and graded.

(ii) Exploitation of ground water resources is made possible by the use of minor irrigation works, including the construction of tube-wells, dug wells, etc. and the renovation of tanks etc. The additional irrigation potential was created to the extent of 15 m. hectares in 1976-77, as against 1.2 m. hectares in 1973-74. Against the target of 7.2 m. hectares during the Fourth Plan, the achievement was of the order of 8.2 m. hectares. The over-all level of cropped area benefiting from minor irrigation works was 277 m. hectares in 1977-78 as against 26.2 m. hectares in 1977-76, 25.2 m. hectares in 1975-76, 24.6 m. hectares in 1974-75, 23.5 m. hectares in 1973-74 and 19.0 m. hectares in 1968-69.

Since the adoption of new strategy for agricultural development in 1966-67, considerable progress has been made in the sphere of ground work development, as would be clear from the following data ;

Item	1965-66 (In 000)	1968-69	1973-74	
1. Dug wells	5,119	5,695	6,500	9,256
2. Electric pumps	513	1,080	2,435	3,153
3. Private Tubewells	93	266	820	412
4. State Tubewells	12	15	20	—

(Annual Reports of the Department of Agriculture for 1973-74, p. 27 ; and for 1977-78, p. 36).

Ayacut Development and Water Management

'Ayacut development' refers to water utilization and management in areas recently brought under irrigation and can also cover areas newly reclaimed by flood control, drainage and soil conservation measures. It implies planned development of agricultural production in those areas as a composite operation involving adoption of improved agricultural practices, land shaping, construction of channels, supply of inputs and introduction of new cropping pattern.

Each water use management pilot project covers about 10,000 hectares of area in a compact block mainly in a region where percentage of unutilised irrigation potential is comparatively high. During 1973-74, it was decided to establish 25 such projects in the country.

Evaluation of the New Agricultural Strategy

There has been no doubt that not only the production of foodgrains and the productivity per hectare has increased due to development of new varieties of wheat and rice. The production of foodgrains increased from 89.00 m. tonnes in 1964-65 to 94.0 m. tonnes in 1968-69 and over 99.5 m. tonnes in 1969-70. In 1970-71, the production was of the order of 107.80 m. tonnes. But it declined to 104.68 m. tonnes in 1971-72. This was 7.32 m. tonnes less than the target of 112 m. tonnes. In 1972-73, the production was 9.03 m. tonnes, in 1973-74, 104.6 m. tonnes, in 1974-75, 99.8 m. tonnes, in 1975-76, 121.03 m. tonnes and in 1976-77, it was 111.57 m. tonnes.

The average yield per hectare of foodgrains was 783 kgs in 1967-68, rose to 872 kgs in 1970-71, and to 1040 kgs in 1975-76 1972-73. In the case of wheat, for which the productivity rose sharply, the yield per hectare was 1,103 kg in 1967-68, 1307 kg in 1970-71, and 1409 kgs in 1975-76. In case of rice, the increase was not so significant. The yield per hectare was 1032 kg in 1967-68, which rose to 1123 kg in 1970-71 and 1141 kg in 1971-72. It was 1246 kg. in 1975-76. In case of other cereals and pulses, the impact on productivity has not been of any significance.

There is no doubt that much heralded green-revolution has arrived in India but in its scale and depth it has not affected the country's rural economy so much so as to be called the "green revolution". It has so far been confined to a very limited area and it has affected only a few crops, the principal being wheat. The area which has experienced agricultural productivity revolution on a large scale in the Punjab which is followed by Haryana and Ganga-Yamuna Doab, its spatial extent is 'selective'. In these areas of exceptionally high and very high agricultural production the alluvium is cultivated repeatedly with both simple and sophisticated implements; the lands are heavily manured and the water resources are carefully husbanded, so much so that with irrigation farmers fight drought and inconsistency of rainfall.¹ These farmers are enterprising and have love for the holdings, are educated and progressive, hence have made full use of the package programme.

As contrasted to these areas, the return in farm production has been rather low in most of the districts lying in arid, semi-arid and sub-humid zones of M. P., Karnataka, Assam Hills, Telangana and Rayalseema, Rajasthan, Gujarat, Bihar etc. Here problem of scarcity of water or excess of water leading to flooding and water-logging need to be solved and with adequate, assured and developed water supply in drought-stricken areas, the liberal use of fertilizers and improved seeds and better tillage, scientific break-through in agriculture could be achieved.

These programmes and agricultural transformation they ushered in, have only served to accentuate the already wide socio-economic gap that existed between the farmers of more fortunate regions (with assured rainfall and irrigation) and those of areas largely dependent upon the vagaries of a notoriously fickle monsoon. The disparities in incomes have been widened by these innovations. Agricultural inputs (in particular chemical fertilizers) were largely cornered by rich landlords, whereas the poor farmers found themselves handicapped by small size of farms, and inadequate inputs, techniques and water supplies. The Green Revolution has, therefore, tended to have its most concentrated application on large farms. Earnest Feder has correctly observed, "the Green Revolution is a programme for large land owners *par excellence* and cannot be different; they are already better equipped, have almost exclusive access to input and output markets, and are the major, if not the exclusive, recipients of agricultural credit."² Accordingly, with the concentration of new technology to large farms, the inequalities have further increased.

1. Singh Jasbir, *The Green Revolution in India*, 1974, p. 40.

2. Feeder, Earnest, 'The Peasants' Perspectiveness in the under-developed countries, *Monthly Review*, May, 1975, p. 22.

EXTENDING THE GREEN REVOLUTION AND MAKING IT MORE SUCCESSFUL

On the basis of the field experience and laboratory results at various Research Institutions, stations, the Report of the working Group on Agriculture for the Fourth Five Year Plan, the following crop patterns have been identified, evolved and suggested for the programme for various regions in the country as given in the appendix at the end of the chapter.

1. Problem of Post-Harvest Technology

The Green Revolution has brought in its wake many problems. Certain difficulties arising out of it were not intelligently anticipated. For instance, labour for harvesting, binding and threshing is scarce in many areas after a bumper crop. The development and mass manufacture of harvesting and threshing equipment, well within the reach of small and medium farmers, is therefore, an urgent necessity.

Another problem of post-harvest technology is that of safe storage of foodgrains in the houses or fields of farmers, for storage structures of the type common in agriculturally advanced countries would be impracticable in India but the *Pusa Bain* and its larger version *Pusa Cubicle* seem wonderfully tailored to meet such demand.

2. Planning for Arid, Semi-arid Unirrigated Areas

Irrigation is the inescapable need for sustained and successful agricultural operations in these areas, where loamy sand and loam respond to irrigation and yield good results. More irrigation programmes can be undertaken in these areas, where rain-fed cultivation is eminent and dependency on natural caprices is considerably high.

Dry-farming practices may also be adopted in these areas, so that the consequences of weather induced fluctuations in total production could be faced without undue difficulty. This could be achieved through appropriate changes in crop planning and fertilizer-use, harnessing indigenous sources of plant nutrient supply and better water management and conservation.

3. Introduction of Suitable Land-use Pattern

Stable production can be achieved by adopting suitable cropping pattern. The introduction of Forage production and livestock improvement programmes in rainfed areas could contribute more substantially to the economy of dry lands than the crops.

4. Improvement in Agricultural Production

The level of agricultural production in major parts of India should be raised by intensification and modernization. Experience has proved that quick and impressive results can be accomplished.

only by means which are entirely different from the conventional farm practices. Extension education should be increasingly applied to agriculture to catalyse a movement for the use of chemical fertilizers judiciously effectively and properly. The importance of careful husbandry ; pests, plant diseases and weed controls must be recognised.

5. Institutional Changes

In addition to rationalisation of land tenure, ownership system also needs modification. Land and capital reforms are the need of the hour.

APPENDIX 1

Northern Region

In brief, the following may be the broad pattern of co-operation for various states in this region —

1. *Jammu & Kashmir*

Paddy-wheat/mustard/vegetables ;
Summer-Paddy-Paddy-wheat ;
Satha maize-hybrid maize-wheat ;
Groundnut/ hybrid bajra-barley/ wheat.

2. *Punjab, Haryana, Delhi & Himachal Pradesh*

Maize/Potato-wheat
Satha maize-hybrid maize-wheat
Cotton-/ground nut/bajra-wheat/barley/gram ;
Cotton-senji/berseem-cowpea ;
Paddy/hybrid bajra/soyabean-wheat/barley/gram ;
Moong-maize-potato/toria-wheat

3. *Rajasthan*

Hybrid jowar/bajra/maize/paddy
Mexican wheat/gram/barley/rape
Jowar & guer-gram
Cotton-senji/pea
Maize/cotton/wheat

4. *Uttar Pradesh*

Maize-potato-wheat (for western region)
Paddy/jute-wheat (for eastern region)
Moong/cowpea-hybrid maize-wheat

Southern Region

1. *Andhra Pradesh*

Paddy-cotton (216F) (in deltaic area)
Paddy-paddy ragi ;
Jowar-onion/chillies
Groundnut-red gram

2. *Kerala*

Paddy-paddy-paddy
Paddy-paddy-groundnut ;
Paddy-sweet potatoes/vegetables ;

3. *Karnataka*

Paddy-paddy-ground nut-ragi-sugarcane ;
Paddy-ragi-ragi ;
Groundnut/hybrid Jowar/gram/wheat
Hybrid maize potato ;groundnut/cotton

4. *Tamil Nadu*

Paddy-paddy-paddy-groundnut-millets
Hybrid Jowar-cotton-cotton
Hybrid Jowar-ragi-wheat-cotton

Eastern Region

1. *Assam*

Ahu paddy salipaddy-boro paddy (in irrigated area)
Ahu paddy-pulses-mustard (unirrigated areas)
Jute-sali paddy boro paddy (unirrigated areas)
Hybrid maize-potato-gram ;

2. *Bihar*

Jute-paddy-mexican wheat ;
Paddy-paddy-wheat potato ;
Maize-urd-paddy-wheat/pulses

3. *Orissa*

Paddy-paddy-paddy
Jute-paddy-wheat/gram
Hybrid maize-ground nut-vegetables

4. *West Bengal*

Aus paddy-aman paddy-wheat
Jute-paddy-wheat/potato
Ground nut/maize-potato/pulses

5. *Western and Central Regions*

1. *Madhya Pradesh*

Cotton-groundnut-pulses-fodder-wheat
Hybrid Jowar/maize-gram/groundnut
Groundnut/paddy/wheat
Paddy-linseed/gram

2. *Maharashtra*

Cotton/Paddy/pulses-Mexican wheat/potato/vegetables
Paddy-wheat or Laxmi cotton (in rice fallows)
Cotton (Laxmi)-wheat/Gram/groundnut (in Deccan area)

3. *Gujarat*

Groundnut/cowpea-cotton (PRS 72)
Jowar/bajra/paddy-wheat
Groundnut/pulses-wheat
Paddy-cotton (Laxmi) in Kakrapara project area.

The Food Problem

Three fundamental or basic needs of humanity are food, shelter and clothing. Rightly does the Indian Constitution provide that every man, woman and child has a right to food, to work and to enjoy the basic necessities like education, medical aid and employment facilities. Unfortunately even after 32 years of Independence, the problem of food has remained unsolved. It has been estimated that every third person in Asia suffers from hunger and a much larger people suffer from malnutrition. India is no exception to this observation. According to Dr. P.V. Sukhatme, "Every 4 persons out of 10 in the world are hungry, and one of them is an Indian... Roughly 10% of our people are under-nourished and, therefore, hungry". Millions of people live on starvation line, they are ill-fed, ill-clothed ill-doctored, ill-housed, ill-educated and steeped in poverty.

Historical Evolution of Food Problem

Malnutrition, starvation and occasional famines have been more or less endemic under Indian conditions. "During the last 300 years, India has experienced 26 major famines ; during the last 700 years, there have been 17 very severe food disasters ; and during the historical times of the 34 great famines of the world 18 have occurred in India. The frequency and cyclical order show the peculiar susceptibility of this country to crop failures and recurrent shortages of food supply.¹" Scarcities and famines in the 19th century were due not to the actual shortage of food in relation to its total population but to the lack of transport facilities and consequent difficulty of moving supplies from one part of the country to the other.

In the earlier part of the nineteenth century India was a self-sufficient country in matters of food production, but in 1880, the Famine Commission sounded a note of warning that excessive pressure of population on land was resulting in inefficient cultivation of land and lower per capita availability of food. It pointed out that the country, taken as a whole, was definitely surplus in food. But the

1. D. S. Chauhan, *The Food Problem*, 1958, pp. 1-2.

minority members opined that the alleged surplus (of 5 million tonnes) was greatly overestimated.¹ By 1880 India had reached a position where demand and supply were precariously balanced at the then levels of income and population and that any increase either in population or incomes were likely to upset the balance. On the other hand, Shri Gopalaswamy, basing his conclusion on the average level of exports of foodgrains at that time has observed that "in or about 1880 India was normally surplus in foodgrains including both rice and wheat and the surplus was of the order of 12 lakh tons."² As per his findings, the exports of foodgrains amounted to 2.4 m. tonnes in 1895-96. Even in famine years, 1896-97 and 1899-1900, India exported 1.5 m. and 2.2 m. tonnes of foodgrains respectively. Again, the Famine Commission of 1898 put the annual surplus in foodgrains at 9.5 m. tonnes. During 1890-91 to 1919-20, India exported 72.8 lakh tonnes of foodgrains, while imports amounted 34.6 lakh tonnes. The net exports of food grains declined from the yearly average of 1.4 m. tonnes in five years ending 1894-95 to 0.4 m. tonnes in the quinquennium ending 1919-20. *The five year period 1881-85 turned out to be the dividing line between self-sufficiency and shortage in foodgrains in the country.* It was at this time that India ceased to be surplus or even self-sufficient in foodgrains and came to be a net importer of foodgrains, the net annual imports in five years ending 1924-25 being 1.6 lakh tonnes. There was a rapid increase in population after 1921 but for the time being this was offset by expansion of production³ and increase in trade flows. Between 1920-21 and 1939-40, the average annual exports fell from 9.8 lakh tonnes in 1921-25 to 6.9 lakh tonnes in 1936-40, whereas imports increased from 1.4 m. tonnes to 207 m. tonnes.⁴

The position deteriorated further after the separation of Burma in 1937. This was further aggravated with the outbreak of Second World War, so that rice imports from Burma were suddenly cut off in 1942 with the fall of Burma in the Japanese hands. In 1941-42, the net imports diminished to 4.3 lakh tons from 9.6 lakh tons in 1940-41. During 1942-43, with the complete cessation of imports and crop failures in Bengal the situation deteriorated very rapidly when 3.5 million people died of starvation. However, under an international agreement, a net supply of 3.0 lakh tonnes was received by India. Imports of foodgrains had to be managed to the tune of 7.3 and 9.3 lakh tons during 1943-44 and 1944-45. On an average

1. *Report of the Famine Commission, 1880, Pt. I, p. 66.*

2. *Census of India Report, Pt. I, A. p. 164.*

3. The area under cultivation went up from 103 cents per head in 1901 to 111 in 1921. The irrigated area rose from 16 per cent of the total in 1891 to 18 per cent in 1921. The double cropped area likewise increased from 18 to 90 per cent during the same period. Against this the population increased from 236 to 248 millions or an increase of 5 per cent in a period of 30 years. *Census of India Report, 1951, Pt. I, p. 141.*

4. *Ibid.*, pp. 164-66.

between 1940 and 1946, the imports were only half a million tons ; whereas before the war they averaged 1.39 million tons. As prices of imports rose heavily, India suffered a net loss of Rs. 199 million in 1940-41 to 1946-47 period as against a loss of Rs. 78 million in 1930-31 to 1939-40 period. In the post-war period imports rose sharply from 2.58 million tons in 1946-47 to 3.05 million tonnes in 1948-49. The deficit on the basis of 1947-48 production figures was estimated at 4.8 m. tons. During 1947-52, the average level of imports was 3.72 million tons. Imports of foodgrains have shown a fluctuating tendency with fluctuating production from year to year.

Imports of Foodgrains (in Rs. Crores)

Year	Cereals and Cereal preparation	Wheat	Rice
1950-51	99.56	53.50	24.51
1953-56	17.68	11.92	4.01
1960-61	181.38	153.20	22.44
1965-66	322.00	264.74	41.89
1966-67	650.98	423.04	81.64
1967-68	518.20	378.47	54.76
1968-69	336.62	259.49	57.47
1969-70	260.98	183.33	58.25
1970-71	213.01	173.37	29.82
1971-72	131.21	102.60	18.07
1972-73	80.78	48.16	10.71
1973-74	473.0	N.A.	N.A.
1974-75	703.8	N.A.	N.A.
1975-76	1342.5	1210.6	46.6
1976-77	878.6	808.1	46.0

The bulk of imports of foodgrains were from Argentina and U.S.A. Imports were also made from Australia, Canada and U.S.S.R. partly on commercial basis and partly as aid, other importers are U.A.R., Burma, Thailand and Cambodia.

By the time the First Plan came to be drawn, the annual deficit as measured by imports was around 3 m. tons. As against a target of 61.5 m. tons, during the First Plan period, the food production stood at 65.8 m. tonnes, which marked an increase of 11.8 m. tonnes over 1949-50. Imports of foodgrains steadily declined from 4.8 m. tons in 1951 to 0.7 m. tons in 1955. The year 1953-54 was agriculturally the best of the whole plan period. Food production showed a phenomenal increase of 14.4 m. tons over the base year (1949-50) production of 54 m. tons.

With the Second Plan began the more serious phase of the food problem in the country. The last year of the First Plan was agriculturally not as good as the preceding two years. There were scarcity

conditions in certain parts of Rajasthan, Maharashtra, Bihar, Orissa and Tamil Nadu in 1955-56. The States of Assam, W. Bengal, U. P., Delhi and Punjab were affected by floods ; while certain coastal districts of Tamil Nadu suffered on account of cyclone. The damage, however, was mostly caused to inferior grains. Supplies of foodgrains began to run short of market demand, which necessitated once again dependence on imports to bridge the gap. In 1956, 1.4 m. tons of foodgrains were imported. Next year there was a sharp decline in production of foodgrains, the production index falling from 120.5 in 1956-57 to 107.3 in 1957-58. Imports of foodgrains shot up to 3.6 m. tons in 1957, 3.2 m. tons in 1958 and 3.8 m. tons in 1959. Agricultural production increased in 1958-59 and 1959-60. Production of foodgrains was 77.6 m. tons in 1958-59 as against 65.4 m. tons in 1957-58. In 1959-60 the output was slightly lower, being 74.7 m. tons. The unexpected increase in production had led the planners to revise their Second Plan target of food production to 80 m. tons. In 1960-61, the production was of the order of 79.7 m. tons. Even this proved inadequate to meet the market demand. Hence 5.1 m. tons of foodgrains were imported in 1960. Agricultural Production Team (1959) observed, "An immediate and drastic increase in food production is India's primary problem of next 7 years. Without enough food India's hopes for improving human welfare, achieving social justice and securing democracy will become almost impossible of attainment." The Team estimated that the country was short of 28 m. tons of foodgrains in 1966 and, therefore, a target of 110 m. tons was suggested by it for the Third Plan. However, the Plan put the target of 100 m. tons to be sufficient for securing self-sufficiency in foodgrains. Unfortunately, agricultural production throughout the five years of the Plan except in 1961-62 was 82.7 m. tonnes. It fell to 78.5 m. tonnes in 1962-63, the year 1964-65 suffered from adverse climatic conditions. The domestic output of foodgrains in 1961-62 was 82.7 m. tonnes. It fell to 78.5 m. tonnes in 1962-63 and 80.2 m. tonnes in 1963-64. There was a record production of 89 m. tonnes in 1964-65 but was followed by a steep fall to 72.3 m. tonnes in 1965-66 which was a year of severe drought in several parts of the country. Demand was rising on account of increase in population and rise in incomes caused by development and defence expenditure. This caused a wide gap which had to be filled up by larger imports, intensification of internal procurement, taking over greater responsibility for distribution of available supplies by extension of rationing and opening of more fair price shops and launching an emergency food production drive to encourage production of foodgrains. Imports amounted to 4.5 m. tons in 1963, they rose sharply to 7.4 m. tons in 1965 and 10.3 m. tons in 1966.

✓ Taking an overall view of the Plan period as a whole, we find that our difficulties in the matter of foodgrains have, on the demand side arisen primarily from rapid increase in population and rise in income. As compared with 369 m. in 1950-51, India had to feed a

population of 511 m. in 1966-67. In the first two Plan periods, increase in production was keeping pace with the growth of demand but during the Third Plan, production fell far behind the increase in demand. The food situation that was difficult during the Second Plan period became serious after 1960-61. The two droughts in 1965-66 and 1966-67 rendered it critical so that the imports amounted to 86.67 m. tons in 1967. Following the recovery of production in 1967-68 from the abnormally low level of two drought years, there was an increase of production of foodgrains to the order of 95.1 m. tonnes in 1967-68. In 1968-69 it was lower by about a m. tonnes (i.e., 94.0 m. tonnes). In 1969-70, aggregate foodgrains production increased to 99.5 m. tonnes.

In 1970-71, the production was 107.8 m. tonnes. It fell to 105.2 m. tonnes in 1971-72 and further to 95.2 m. tonnes in 1972-73. With an increase in foodgrains production imports fell from 5.69 m. tonnes in 1968 to 3.85 m. tonnes in 1969, to 3.61 m. tonnes in 1970 to 2.21 m. tonnes in 1971. In 1972, the total imports amounted to 0.45 m. tonnes. However, in view of the fall in domestic production in 1972-73, it was decided towards the later part of 1972 to import 2 m. tonnes foodgrains to replenish the buffer stock and to ensure uninterrupted flow of supplies through public distribution services.

Production of food grains amounted to 97.0 m. tonnes in 1972-73 and it was 104.6 m. tonnes in 1973-74. In 1974-75, it was only 99.8 m. tonnes. In 1975-76, it increased to 121.0 m. tonnes but again fell to 111.6 m. tonnes in 1976-77 to 73.9 m. tonnes in 1977-78. As against the production figures, the imports were to the tune of 4.45 lakh tonnes in 1972, 35.9 lakh tonnes in 1973, 43.8 lakh tonnes in 1974, 73.9 lakh tonnes in 1975, 64.4 lakh tonnes in 1976 and 4.8 lakh tonnes in 1977. The imports were on increase due to unfavourable weather conditions, especially for the kharif crops.

Year	Total quantity (in lakh tonnes)	C & F value (estimated) (in Rs. crores)
1947	23.71	93.99
1948	28.87	129.72
1949	37.65	144.60
1950	21.59	80.60
1951	48.01	216.79
1952	39.26	209.07
1953	20.35	85.95
1954	8.43	48.53
1955	7.11	33.11
1956	14.43	56.34
1957	36.46	162.39
1958	32.24	120.51
1959	38.68	141.41

1960	51.37	192.84
1961	34.95	129.56
1962	36.40	141.09
1963	45.56	183.60
1964	62.66	266.25
1965	74.62	290.32
1966	103.58	523.13
1967	86.72	532.16
1968	56.94	361.20
1969	38.72	253.01
1970	36.31	213.01
1971	20.54	131.21
1972	4.46	80.78
1973	35.9	473.00
1974	48.3	464.00
1975	75.9	1342.8
1976	64.4	878.6
1977	4.8	N. A.

Food Deficit Areas

Not all areas in the country are surplus areas in matters of food production. However, four main scarcity pockets may be mentioned as below :

1. Areas like eastern Uttar Pradesh and northern Bihar which have a very dense population, extremely small holdings and low per capita income, and are mainly paddy growing areas with heavy rainfall and subject to frequent floods and other natural calamities. In these areas the rural people live in a precarious condition and when either floods come or rains fall, there is acute distress. In the lean season, prices tend to spurt up even on slight disturbance making these areas epicentres for further rise in prices in neighbouring areas.

2. There are areas like the districts of W. Bengal near Calcutta with similar economic and demographic conditions where the disturbing factor is often the pressure of demand supported by high purchasing power from the neighbouring metropolis whenever prices there tend to go up for any reason.

3. There are dry areas, e. g., some of the millet growing areas of western India (including Rajasthan and Gujarat) and the Deccan Plateau which have relatively sparse population with scanty rainfall. The yield of land in these areas is usually poor and the income of the farmers is also amongst the lowest in the country. These areas are subject to frequent drought which initiates the usual vicious circle of failure of crops followed by rise in prices, scarcity amongst the people, hoarding and further rises in prices.

4. There are tribal areas, i. e., in Assam and Central India where per capita income is low, transport cost is high and the eco-

nomy is not only primitive but also often isolated from the rest of the country. Any failure of local crops leads to unusual distress in these areas.

It is primarily the first three types of scarcity areas where the first signs of difficulty manifest themselves.

Causes of Food Shortage

Food shortage is a recurring phenomenon which periodically bedevils Indian economy. Too long have India watched the three year cycle of food shortage followed by a year of bumper crops. A little reflection would suggest that the causes of the malaise are deep-seated. They involve the whole complex of land relations in the country besides a large number of economic and social factors.

There are, generally speaking, two things which deteriorate the food situation and make it more intense and difficult. *First*, a rapidly mounting burden on the land resulting from the rapidly growing population. *Second*, a declining trend in the average productivity of land. Besides these, there are other factors also which have affected the food supply.

I. *Partition of the Country.* This deteriorated India's food situation to a great extent because the foodgrains surplus areas of West Punjab, Sind and E. Bengal went over to the share of Pakistan, while the foodgrains deficit areas of Madras, Orissà, and W. Bengal remained in India. This reduced her agricultural production and created difficulties both for the foodgrains and commercial crops like cotton and jute. After partition India had obtained 82 per cent of the total population of the Undivided India, but her share in the total area was 77 per cent. Her share in the area under rice was 72 per cent; wheat 70 per cent; cereals 75 per cent and under irrigation 70 per cent. Pakistan got more of cultivated area and irrigated land to feed a comparatively small percentage of population. All those areas which traditionally are famine tracts because of their frequent affliction by drought formed part of the Indian Union. This was responsible for rendering the food production of the country highly unstable and making the country more vulnerable to scarcities and famines than Pakistan.¹ The position became worst when about 10 m. displaced persons migrated to India from Pakistan. India's foodgrains deficit increased by nearly a million tonnes by the separation of Pakistan in addition to a deficit of 1.39 m. tonnes by separation of Burma. Thus, a serious blow to India's food economy came in the wake of depletion of reserve stocks and the necessity of imports increased correspondingly.

2. *Increase in population.* India's population has been rising at a rapid rate. It was 238 million in 1901. Since then it has grown at a sporadic rate. In the first 20 years (1901-20) the growth rate

1. *Grow More Food Enquiry Committee Report*, 1952, p. 5.

was 5.4 per cent. In the next 20 years (1921-40), it was 25.23 per cent and in the next 20 years (1941-60) it was 34.9 per cent. It rose to 547 m. in 1971. During 1951-61, we added 80 million more people, and this addition was of the order of 108 million during 1961-71. Population increased by 24.6 per cent during the decade of 1961-71. It rose to 640 millions in 1975 and is further expected to rise to 900 millions by the end of the century unless we are able to achieve something miraculous in the field of family planning during the coming decades. With every increase in population, the net area sown per capita has been going down. It declined from 1.11 acres in 1911-12 to 1.04 acres in 1931 ; to 0.94 acres in 1941 to 0.84 acres in 1951 and to 0.75 acre in 1961 and to less than 0.60 in 1971. With the decline in the cultivated area per capita, the share of food and other produce of cultivation available to each individual has been declining. It is an all pervasive fact that whilst the area of cultivated land, irrigated and double-cropped had decreased since 1921, population during the 30 year period (1921-51) increased very much faster. In 1950-51, the net area sown was 293.4 m. acres ; it increased to 327 m. acres in 1960-61 (i. e., there was an increase of 8.2 per cent). The double cropped area increased from 32.5 m. to 51.5 m during the same period (i. e., an increase of 0.6 per cent) whereas the population increased from 360 m. to 439 m. (i. e., an increase of 21.5 per cent). In 1974-75, the net area sown was 138 m. hectares ; the double cropped area was 27 m. hectares and the population in 1971 was 547 m. as against the net sown area of 141 m. hectares and double cropped area of 26 m. hectares, i. e., both these areas have remained more or less stationary, whereas the population has increased tremendously. The following table shows this :

Trends in Area Cultivated¹

Year	Net area sown	Total Cropped area	Double Cropped area	Net Irrigated area	Gross Irrigated area
(in million hectares)					
1965-66	136.24	155.36	19.12	26.34	30.88
1966-67	137.30	157.40	20.10	26.90	32.65
1967-68	139.85	163.65	23.80	27.18	33.18
1968-69	137.56	159.66	22.10	290.3	35.44
1969-70	138.70	163.78	25.08	30.41	31.29
1970-71	141.16	167.41	26.25	31.83	38.55
1974-75	138.33	169.53	26.78	33.61	41.59

With an increase in population, the per capita availability of foodgrains has been fluctuating greatly. It was 595 gms. per day per capita in 1951 ; 468 gms. in 1961 ; 469 gms. in 1971. It fell to

1. *Various Issues of Indian Annual*, and for 1975, p. 162 ; and *Indian Agriculture in Brief*, 1977, pp. 37, 38, 40.

467 gms. in 1972, to 424 gms. in 1973. Since then it has been fluctuating. It was 453 gms. in 1974 ; 408 gms. in 1975 ; 458 gms. in 1976 and 439 gms. in 1977.

3. *Low Productivity of Land.* In India the fertility of land has been declining for more than one reason. The average production per hectare is about 90 per cent of what it was about half a century back. There is a decline of about 10 per cent. This decline has been fast during the last 30 years ; and had taken place because of the coincidence of several factors, such as the substitution of heavy yielding crops and varieties without adequate compensation through artificial methods of restoring fertility ; increasing deficiency of humus in the soil ; inadequate drainage facilities ; extension of agriculture on marginal and sub-marginal lands which generally yield less and bring about a decline in the average productivity ; disturbance in the practice of fallowing and crop rotations because of the increasing demand for food and other agricultural products.¹ Soil erosion and increasing salinity, aridity, alkalinity and semi-desert conditions developing in areas which were agriculturally better so far. The result of these factors is that the average yields of cereals in India are among the lowest in the world, being about 1,877 Kg. per hectare for milled rice 1,338 Kg. for wheat and 885 Kg. per hectare for all cereals including paddy (1975-76)

However, in individual crops, in some cases there has been noticed an increase in the yield per hectare for some years past.

Yield Per Hectare in Kgs.²

Crop	1968-69	1969-70	1970-71	1971-72	1972-73	1974-75	1975-76
Rice	1,076	1,073	1,123	1,145	1,073	1,045	1,246
Maize	997	968	1,279	892	1,084	948	1,173
Wheat	1,169	1,209	1,307	1,382	1,254	1,338	1,409
Barley	879	982	1,090	1,028	967	1,087	1,125
Jowar	523	522	466	461	435	643	592
Bajra	315	426	622	455	324	390	494
Ragi	736	761	872	903	837	867	995
Small millets	380	360	416	351	353	361	403
Total Cereals	843	865	944	936	883	907	1,070
Gram	607	715	663	636	644	570	709
Tur	718	690	709	681	750	725	785
Other pulses	369	371	393	370	294	334	375
Total Pulses	490	531	524	499	465	455	553
Total Foodgrains	781	805	872	859	811	824	943

4. *Rising Agricultural Prices.* The soaring prices of agricultural products in general and those of foodgrains in particular have badly affected the supply of these articles. These must be weighed against the enormous growth in population during these years. With the rise in prices the producer's need for cash to meet necessary

1. R. B. I., *Report on Currency and Finance*, Vol. I, *Economic Review*, 1974-75, p. 11.

2. *Indian Agriculture in Brief*, 1974, p. 71 ; *Ibid.*, for 1977, p. 13.

commitments could be fulfilled with lower sales. Besides, a tendency for holding foodgrains for a longer period than usual develops in anticipation of further rise in prices. This situation creates an artificial scarcity of the foodgrains in the country. The basic causes for rise in foodgrains prices are the increased purchasing power in the hands of the people due to increased investment outlay of the Plans, shortfall in the production of major crops, inadequate stocks with the Government and extensive hoarding and speculation by the producers and the wholesalers in the quasi-free market mechanism.

5. *Physical Causes.* Indian agriculture is a gamble in rains. Variations in rainfall in different parts of the country are more marked and frequent. Besides the seasonal and local uneven distribution the variation from year to year is very great. Moreover, for last few years the monsoon has been very abnormal over vast areas and there have been severe droughts. The result is that water is not available as and when required for most of the crops during greater part of the year and over by far a larger area; and there is a great deal of insecurity of harvest. On the other hand, in northern and eastern parts large areas are subject to heavy floods, and hailstorms which damage crops.

There has been a wide fluctuation in the production of foodgrains due to favourable weather conditions, as would be clear from the following table :

Production of Foodgrains (in m tonnes)¹

	1964- 65	1965- 66	1966- 67	1967- 68	1968- 69	1969- 70
Cereals of which	77.0	62.4	65.9	83.0	83.6	87.8
Rice	39.3	30.6	30.4	37.6	39.8	40.4
Wheat	12.3	10.4	11.4	16.5	18.7	20.1
Coarse grains	25.4	21.4	24.1	28.8	25.2	27.3
Pulse of which	11.7	9.9	7.3	12.1	10.4	11.7
Gram		4.2	3.6	6.0	4.3	5.5
Total Foodgrains	89.4	72.3	74.2	95.1	94.0	99.5

	1970- 71	1971- 72	1972- 73	1973- 74	1974- 75	1975- 76	1976- 77
Cereals of which	96.6	93.6	87.1	94.66	89.81	107.99	100.36
Rice	42.2	42.7	39.2	44.05	39.58	48.74	42.79
Wheat	23.8	26.4	24.7	21.78	24.10	28.85	29.08

1. *Economic Survey* for 1974-75; and for 1977-78, p. 62

Coarse grains	23.0	24.5	23.2	28.84	26.12	30.11	28.50
Pulses of which	11.8	11.1	9.9	10.01	10.01	13.04	11.21
Gram	5.2	5.1	4.5	4.10	4.01	5.88	5.37
Total Food-grains	107.8	104.6	97.0	104.67	99.83	121.03	111.57

Nature of the Food Problem

India suffers not only from physical hunger but also from specific hunger, i. e., there is to be found not only the quantitative inadequacy of the diet (known as *under-nutrition*) but there is also deficiency of one or more essential nutrients in the diet (known as *mal-nutrition*).¹ People who do not get enough quantity of food to eat are under-nourished and those whose diets are inadequate in quality are malnourished. The under-nourished are, however, usually mal-nourished.²

Production of Food grains since 1947-48 to 1976-77

Year	Rice	Wheat	Total Foodgrains including other cereals, millets and pulses
1947-48	21,588	5,660	52,829
1948-49	22,960	5,741	52,585
1949-50	23,542	6,391	54,916
1950-51	20,576	64,62	50,825
1951-52	21,300	61,83	51,996
1952-53	22,899	7,501	59,201
1953-54	28,214	8,017	69,821
1954-55	25,219	9,043	68,035
1955-56	27,557	8,760	66,850
1956-57	29,037	9,403	69,855
1957-58	25,525	7,998	64,311
1958-59	80,847	9,958	77,141
1959-60	31,676	10,324	76,672
1960-61	34,574	10,997	82,018
1961-62	35,663	12,072	82,706

1. *Under-nutrition* has been defined as an inadequacy in calorie intake which if allowed to continue for a long enough time results in either loss of normal body weight for the same physical activity or reduction in physical activity for the same body weight or both.

Malnutrition refers to the lack or inadequacy of a particular or several essential nutrients such that if made good, the signs of specific deficiency diseases are eliminated.

2. Sir John Boyd Orr (1950) concluded that "a lifetime of malnutrition and actual hunger was the lot of at least two-thirds of mankind. . . . and the proportion of the people in India who did not get enough of the right type of food to eat was even higher than two-thirds." According to him, "permanent under-feeding and periodic starvation is a rule in India. In normal times about 30 per cent of the population do not get enough to eat, while much larger section of the people have

1962-63	33,217	10,776	80,151
1963-64	36,998	9,853	80,642
1964-65	39,308	12,257	89,356
1965-66	30,589	10,394	72,347
1966-67	30,348	11,393	74,231
1967-68	37,612	16,540	95,052
1968-69	39,761	18,651	94,013
1969-70	40,430	20,093	99,501
1970-71	42,225	23,832	108,422
1971-72	43,068	26,410	105,168
1972-73	39,245	24,735	97,026
1973-74	44,057	21,778	104,665
1974-75	39,579	24,104	99,826
1975-76	48,740	28,850	121,030
1976-77	42,790	29,080	111,570

On an all-India basis, about one-third (35.0 per cent) of the population was under-nourished. This is in broad agreement with the estimate of Sukhatme who observed that a quarter of India's households were underfed during 1935-48, and since there has been no appreciable quantitative change in the diet of the people during the last 15 years, the estimate of those who are under-nourished seems to hold good even to day.¹

Opines Dr. Madalgi that, "if we take the deficiency of calorie intake of 15 per cent or more than the nutritionally required quantity as a definite indication of under-nutrition, about one-tenth (9.2 percent) of the urban population and 40.3 per cent of the rural population was under nourished in 1959-60, the all India average being 35.0 per cent."²

The incidence of mal-nutrition is difficult to assess. The evidence indicates that it is far higher and can be placed at least 50 per cent for India as a whole. Further, the majority of the under-nourished are also mal-nourished. It would appear that *some 250 millions of India's population today are either under-nourished or mal-nourished or both*. When over 60 percent of the population in the

to be satisfied almost invariably with illbalanced diet containing a preponderance of cereals, sugar, root vegetable and insufficient *protective foods* of higher nutritive value. Intake of milk pulses, meat, leafy vegetables, eggs and fruits is generally insufficient which leads to ill-health, disease and high mortality in India among the vulnerable groups including infants, children, pregnant and nursing mothers, factory workers and school boys." Quoted by Mamoria, *Social Problems and Social Disorganisation in India*, 1965.

Dr. Castro of Brazil (1952) observed that "about two-thirds of world population is permanently hungry and of these a little less than one third is to be found in India. People here are permanently on starvation level." *Geography of Hunger*.

1. Sukhatme, P. V. *Feeding India's Growing Millions*, 1965, p. 75.

2. Madalgi, S. S. *Population and Food Supply in India*, 1970, p. 68.

country have a per capita total consumption expenditure of less than half a rupee per day it is scarcely surprising if most of them are unable to meet adequately their needs of calories, proteins and other nutrients for a healthy, active life.¹

According to the National Survey made during 1959-60, about one-tenth (9.2 per cent) of the urban and two-fifths (40.3 per cent) of the rural population were under-nourished; for all India, the proportion was about one-third (35.0 per cent). This is the broad magnitude of hunger in India.

The intensity of hunger, i. e., percentage of shortfall in intake of nutrition requirements, varied from 22 to 55 per cent in rural area and between 21 and 38 per cent in urban area. In other words, about 24 million (6.8 per cent) persons were subsisting on just one meal a day and other 125 million (29.2 per cent) persons had to go without a meal every alternate day.

Studies indicate that there is a daily average of 2,040 calories for each person in the country, but in large areas people have to subsist on around 1,000 calories a day. Calories apart, the chief fault with the Indian diet is that it is lopsided—preponderant in carbohydrates and low in proteins.

The phenomenon of under-nutrition coupled with increase in population and per capita incomes, on the one hand, and stagnant production and hoarding activities of traders on the other is mainly responsible for the present food difficulties.

Chief Features of Indian Diets

Indian diet primarily consists of cereals and pulses, which contribute on the average over 75 per cent of the caloric supply, 85 per cent of protein supply, most of the thiamine and niacin supply, about 70 per cent of iron, but only some 30 per cent of fat supply, 40 per cent calcium, 15 per cent of vitamin A, 50 per cent of riboflavin, and negligible amount of vitamins C and D.²

The Diet Atlas of India recently released by the Indian Council of Medical Research (July 9, 1965) reveals some interesting facts about Indian diets. It says that "Rural people provide a large proportion of their total expenditure for foodgrains as compared with the urbanites. On an average, a villager has 41 per cent of his expenditure on foodgrains, eight per cent on milk and milk products and 19 per cent on other items. Against this, the city dweller has 25 per cent of his expenditure on foodgrains, 9 per cent on milk products and 26 per cent on other items." The survey shows that more than half of the population of the country is nonvegetarian, though in Gujarat, Punjab and Rajasthan non-vegetarians constitute less than 40 per cent of the State population

1. Sukhatme, P. V. *Feeding India's Growing Millions*, 1965, p. 75.

2. Sukhatme, *op. cit.*, p. 34.

The calorie intake per adult in Punjab, Himachal Pradesh, U. P. and West Bengal is about 3,000 while in other States it ranges from 2,000 to 2,500. Kerala has the lowest intake with only about 1,800 calories.

The diet is preponderant in cereals. In cereals there is regional variation in consumption, rice being preferred in Southern and Eastern States ; wheat in Central and Northern states and millets and coarse grains in Western and Central India and some specified areas in several states.

Consumption of pulses is highest in Uttar Pradesh followed by Madhya Pradesh, Gujarat, West Bengal and Bihar—between 60 and 100 grams. In Kerala consumption of pulses is less than 20 per cent.

In Andhra Pradesh, Gujarat and U. P. people consume about 160 grams of millets on an average, while in Madhya Pradesh the average consumption is only 20 grams. Kerala, West Bengal and Himachal Pradesh consume no millets at all.

As regards consumption of milk and milk products Punjab tops the list with a daily consumption of 220 grams, followed by Gujarat and Maharashtra with 140 and 100 grams respectively. Kerala and Bihar are at the far end with less than 20 grams.

In the case of sugar and jaggery, too, Punjab tops the list—on an average 85 grams are consumed per day per adult. West Bengal and Maharashtra come next with 40 grams each. Bihar, Kerala and Himachal Pradesh have the minimum consumption level.

The consumption of oils is characterised largely by a regional variation in regard to the type of oil consumed. The major vegetable oils consumed are groundnut oil, mustard oil, and sesame oil. The Central and the Western India consume groundnut oil to a large extent ; whereas Northern and Eastern India prefer mustard oil, and Southern India generally consumes sesame oil excepting Kerala where coconut oil is the choice.

Ghee is liked all over India. Now hydrogenated oil (Vanas-pati) has entered in Indian dietary because it compares favourably with ghee in consistency, appearance, use and price.

An analysis of data from dietary surveys shows that well over 90 per cent of the caloric supply of under-nourished households comes from cereals, starchy roots, sugar and pulses, whereas in other countries, these supply only 57 per cent of the calories and the rest is derived from animal products. India consumes less than 2 000 calories per person per day, with 75 per cent of the calories derived from cereals, starchy roots, pulses and sugar ; whereas rich countries consume 3,050 calories per person per day, the share of carbohydrates being 57 per cent. In other words, an average Indian

lives on only one-third of a ton per year as against a quantity of 3 to 4 times as large in the rich countries. Besides, India consumes 51 gm. of total protein, with only 6 gm. derived from animal sources. In contrast, the total protein supplies available per capita per day in rich countries is 90 gms., with 44 grms derived from animal sources. Among the different animal products the consumption of meat and eggs in India is very negligible while that of fish is only one-fifth and that of milk one-fourth of that in rich countries. The consumption of fruits and vegetable is less than one-fourth of that in the rich countries.

However, the most satisfactory feature of the Indian diet is the level and nature of the vegetable protein which is derived from pulses and nuts. Most of the animal protein is derived from milk.

It may be said, the total calorific value of the present average diet is below 2,000 units as against the requirements of 3,000 units. The deficiency is more marked in respect of nutritional quality since items like milk, fish, meat, eggs, fruits and vegetables do not enter into the diet of most of the Indians. The deficiency is rather slight in case of pulses, sugar and jaggery. In other words, the expensive proteins and protective foods are not available to the average Indian and the average diet falls far short of adequacy and the rate of improvement leaves much to be desired.

Per Capita per Day Intake of Foodstuffs as Revealed by the Results of the Diet and Nutrition Surveys in India

Foodstuffs	Recommended for a balanced diet (in gms.)	Mean intake (in grammes)		
		1935-48	1955-58	1966
Cereals	369.5	391.5	390.8	495.6
Pulses	68.6	53.3	56.3	34.6
Leafy Vegetables	107.4	20.0	16.8	35.4
Other Vegetables	124.5	96.6	75.4	107.5
Fruits	37.1	13.7	5.0	9.2
Milk and products	178.4	77.9	66.2	129.0
Fats and Oils	37.6	21.7	12.3	13.7
Flesh Foods (Meat, Fish, Eggs)	35.4	22.2	11.0	13.9
Sugar and Jaggery	40.2	15.8	16.8	37.4

(Source : Adapted from Reports of the Indian Council of Medical Research)

As a result of inadequate food consumption, people become lethargic and sluggish, movements become slow, infrequent and interrupted by long pauses, and any continuous effort is avoided as far as possible. On the other hand, the insufficiency of essential nutrients directly results in the occurrence of specific deficiency

diseases, retardation of growth, poor development in physique, low resistance to disease and infections and low working efficiency. These in turn contribute to high morbidity and mortality among children and low expectation of life.

"It may be that while the over-all pattern of consumption might show an upward trend in terms of calories in future, the great increase in population is sure to render both self-sufficiency in food supply and an adequate consumption for every Indian impossible in near future, unless there is a considerable reduction in the present rates of population growth and appropriate changes in our food habits, the attainment of proper nutritional standard would require a high rate of expansion in food production." According to the findings of the Ministry of Food and Agriculture in India, "if every one is given a balanced diet there will be a shortage of 27 per cent in the case of foodgrains, 50 per cent in the case of pulses, 100 per cent in the case of fruits, 100 per cent in the case of vegetables, 150 per cent in the case of oils and fats and 630 per cent in the case of milk and the shortage in the case of meat, fish and eggs amounts to several hundred per cent." This is a tremendous task in the present circumstances.

The deficiency of food has been estimated in terms of calories at 22 per cent ; in terms of proteins 38 per cent and in terms of fat 64 per cent. The inadequacies in the current diet are strikingly brought out when the diet is compared with food supplies needed to attain the minimum level of nutrition. It shows that the food available today is barely three quarters of the diet under minimum target which is considered as a minimum essential for a healthy active life. Dr. Sukhatme has calculated that "during 1958-59-1960-61 India had an immediate deficit of some 4 million tons in cereals; 6 m. tons in pulses, 9 m. tons in fruits and vegetables, and an equal amount in milk, 2 m. tons in other animal products, and a little over 1 m. tons in oil. These deficits imply that the available total supplies in food-grains must be increased by 15 per cent and those in protective food must be at least 50 per cent to attain the minimum level of nutritional target. Specifically, the increases needed range from about 5 percent in cereals, to 60 percent in pulses, 70 % in fruits and vegetables, 120 % in meat, eggs and fish, 45% in milk and 65 per cent in fats and oils..." Interpreted in terms of future needs, the minimum goal of nutrition implies that for every 10 million increase in population India would have to provide a total of some 2 m. tons of additional foodgrains, half a million tons of fruit and vegetables and four-fifths of a million tons of additional animal products, mostly milk.

Shri J. S. Sharma, in a paper read before the National Food Congress in May 1970, calculated the aggregate requirements of different foodstuffs for human consumptions, on the basis of population trend, income and distribution policy, income elasticity of demand, likely changes in tastes, minimum nutritional standards and the production possibilities, would be of the following order :

Projected requirements of Food Items 1981¹

Food Items	Estimated base level availability in 1969		Projected for 1981		Minimum Nutritional target	Requirements in 1981 for human consumption on the basis of nutritional target (million tonnes)
	Per capita gms/day	Requirement for human consumption (million tonnes)	Per capita gms/day	Requirement for human consumption (million tonnes)	per capita gms/day	
Cereals	395	76.40	440	112.21	400	102.78
Pulses	51	9.83	75	19.13	104	26.52
Sugar	46	8.89	60	15.30	50	12.75
Edible Oils	10.4	2.01	14	3.57	18	4.59
Milk	108	21.02	120	30.60	201	51.26
Meat	3.6	0.70	4.3	1.10	7	1.79
Fish	7.1	1.38	11.8	3.01	17	4.34
Eggs	1.3	0.26	2.2	0.56	2	0.51
Starchy roots	44	8.48	47	12.00	46	11.73
Fruits and Vegetables	58	10.77	75	19.13	137	34.94

Food Requirements for the Country

From time to time efforts have been made to find out as to how much foodgrains are required for the country. *The First Five Year Plan* pointed out that roughly India had a food shortage of 10 per cent of the production, on the basis that every one needed 14 ounces of foodgrains per day. For this an increase of 7.6 m. tons of foodgrains was considered necessary (*i. e.*, from 540 m. tons to 61.6 m. tons). The actual production in 1955-56 was 63.4 m. tons. This eased the food situation to some extent.

The Second Plan pointed out that if the consumption of grains is to be increased to 19 ozs. per day (from 17.2 ozs). India would require 15 m. tons of foodgrains over and above what it produces (*i. e.*, the production was to increase from 65 m. tons to 80 m. tons). As against this target the actual production was of 79 tons by the end of the plan period.

The Agricultural Production Team (1959) suggested an increase of foodgrains production to 110 m. tons. Of this 88 m. tons was needed for consumption purposes ; 126 m. tons for seed and wastage and 9.4 m. tons for seed requirements and safety margin. The requirements of foodgrains were estimated for a population of 480

1. Sharma, J. S. National Food Congress, May, 1970.

m. persons on the basis of 15 ozs. of cereals and 3 ozs. of pulses by 1965-66. The Team suggested, therefore a rate of increase of 8.2 per cent per annum and said that unless this rate is achieved there will be a shortfall of about 25 per cent or 28 m. tons (of the requirements).

The Third Plan fixed the target of 100 m. tons to be achieved by 1965-66. But unfortunately the production was only 79 m. tons in 1963-64, leaving a very big gap between the requirements and the total available supply.

In view of the growth of population and allowing for some improvement in consumption standards, the demand for foodgrains at the end of the *Fourth Plan* was estimated at around 120 m. tons. But the total production was of the order of only 104 m. tonnes. On this basis the *Draft Fifth Plan* has estimated that India should produce 110 m. tonnes of foodgrains by 1978-79.

A recent estimate put the demand for food grains for 1977 at 125.7 m. tonnes on the assumption of a per capita daily consumption of 470 gms of foodgrains. On the basis of population figure given by the Registrar General of India, for the year 2,000, that if family planning measures succeed, the population may be around 80.3 crores and if they do not succeed, it may be 85 crores. On these two assumptions Bhatia has placed the requirements of foodgrains at 160 m. tonnes for the lower population figure and 167.8 m. tons for the higher population figure.¹

According to the *Draft Five Year Plan (1978-83)*, the foodgrains production will have to be of the order of 140.48 to 144.48 million tonnes, of the per capita availability is reckoned at 177 kgs per year. This may have to increase to 190 kgs by 1987-88, on the assumption that the growth of foodgrains demand on the part of the middle and high-income population will decelerate, but the growth of demand from the low-income population will accelerate as greater purchasing power percolates. On these assumptions, the total demand for foodgrains may be 169 million tonnes in 1978-78. If a lower per capita availability is assumed, it may be 164 million tonnes.

Food Policy of the Government

The gravity of the food situation has never been realised in true sense except at the time of serious crisis. Whenever widespread famines occurred, the problem was recognised and was tackled according to the capacity of the Government and with varying degrees of success.

Prior to 1942, no serious steps were taken by the then Government of India to meet the food deficiency in the country either by

1 Bhatia, B. M. "Food, Famine and Population," in *Population in India's Development, 1947-2000*, Bose, A. Desai, P. B. and Mitra, A (Ed.). 1974, p. 229.

way of re-organisation of agriculture or by means of large scale imports. However, with the outbreak of Bengal Famine in 1943, the Government initiated the 'Grow More Food Campaign.' The measure was the result of the recommendations of the *Food Grains Policy Committee*. The Campaign did not fix any target for increase in production of foodgrains but laid down the lines along which efforts for increased production might be made. These included : (i) switchover from cash crops, mainly short staple cotton ; to food crops ; (ii) intensive cultivation of cultivated lands through irrigation, better seeds and manures, and better farming practices ; and (iii) extensive cultivation by bringing under plough current fallows, culturable waste lands, etc. Unfortunately, the results were not very impressive because the whole programme was not supplemented by a comprehensive integrated plan for overall agricultural development and re-organization. Further, the failure was also due to lack of an agency for conveying the message of the campaigns to the actual cultivators.

Other measures taken up to meet the food shortage consisted of the formulation and administration of food controls, introduction of procurement system from villages, equitable distribution through statutory rationing and controls on prices. In August, 1947, as a result of these measures, food rationing was in progress in all big towns and cities covering about 145 million people.

The movement was placed on a planned footing for the next five years from 1947-48. The all-India target for additional production was fixed at 4 m. tons meanwhile the *Foodgrains Policy Committee*, appointed in 1947, recommended upward revision of the target of additional production to 10 m. tons out of which 3 m. tons were to be obtained by reclamation of about 10 m. acres of land and the rest through increased productivity from the area under cultivation. The measures suggested for achieving the targets were : (i) greater attention to minor irrigation works, development of local manurial resources and distribution of improved seeds ; (ii) plans for production of fertilizers ; (iii) survey of ground water resources with a view to undertaking tube-well construction ; and (iv) setting up of central organisation for undertaking reclamation and development of large blocks of culturable waste.

In 1948, the Government invited Lord Boyd Orr to review the working of the campaign and to make suggestions. He recommended that the whole campaign should be placed on emergency footing and bottlenecks of supply and movement of essential materials required for agriculture should be removed. He suggested that self-sufficiency in foodgrains should be achieved by March, 1952. The deficit to be made up was 4.8 lakh tons.

In 1952, a *Grow More Food Enquiry Committee* was set up for examining the working of the G. M. F. campaign. This Committee

recommended that the present G. M. F. campaign should be enlarged so as to cover a wider plan for development of village life in all its aspects.

When food situation worsened in 1955, the prices rose very high. To study the price trends in foodgrains the *Foodgrains Enquiry Committee* was set up in July 1957. According to this Committee, the rise in the prices of foodgrains was due to : (i) a large proportion of foodgrains being retained by the cultivators ; (ii) the increased outlay under the Second Plan and increased bank credit which pushed up the price level ; and (iii) undue optimism about the food situation led to the slackening or at least prevented the accelerating of efforts for increased food production in many States.

The Committee recommended ; (i) the establishment of 'Price Stabilisation Board' so as to stabilise the prices of foodgrains in the country, (ii) establishment of Central Foodgrains Advisory Board, (iii) setting up of cheap foodgrains shops ; (iv) temporary measures of food control in Bombay and Calcutta ; (v) removal of rationing and control ; (vi) the Government to take over the wholesale business of foodgrains ; (vii) imports of foodgrains to be encouraged for few years ; (viii) more attention to be given to grow more food campaign in the Second Plan ; (ix) united efforts on an 'All-India basis' to check the growth of population to be taken up and Government supervision of foodgrain business, etc.

These recommendations were accepted by the Government to a large extent.

In 1959, the Government of India invited the *Ford Foundation Team* experts to give constructive suggestions for solving the country's food problem. The Team suggested a 110 million ton target to provide food enough for the added millions, and to provide some dietary improvement and a safety margin for poor crop years and emergency condition. It was of the opinion that this target can be realized only if an all-out emergency food programme is undertaken. Food production must be given the highest priority.

Some of the important recommendations of the Team were : (1) Since India is a large country with great diversification in climatic and other conditions, no blanket programme will fit all areas. The problem of different areas under different conditions should be solved on its own basis, *i. e.*, improvement programmes should be tailored to fit the conditions faced by individual cultivators village by village, block by block and area by area. (2) The main task should be to develop the low average to the higher levels of output. already attained by individual cultivators from the combination of resources—physical resources, human ingenuity and efforts, fertilizers, pesticides, minor irrigation works, drainage, improved equipment—the food supply can be increased considerably. (3) Those selected

crops and selected areas in each State should be chosen which have the greatest increase potentialities. (4) Priority should be given to projects which make immediate and greatest contribution to food production. (5) In India where cultivation is carried on by millions of small farmers, the prospects of adoption of improved methods of cultivation depend on prospects of an economic return to the agriculturist. This depends on assurance of stability of tenure, stable prices and necessary marketing and credit facilities. (6) At all levels leadership should be provided and co-ordination achieved among planners, administrators, educators, natural scientists, social scientists, local community leaders and cultivators. (7) Provision should be made for suitable storage of foodgrains. (8) The market should be within bullock-cart distance that will pay the guaranteed price when the cultivator has to sell.

Food Corporation of India

With a view to stabilise the prices of foodgrains the State Ministers' Conference (September 1964) recommended for the establishment of a Foodgrains Corporation. Accordingly the Food Corporation of India was set up in 1965 with these objectives :—

(i) To ensure fair price to the grower and to make available foodgrains at reasonable prices to the consumer ; (ii) to encourage production of foodgrains by financing food crops, giving guarantees on behalf of growers and by providing facilities like fertilizers, sprays and crop insurance ; (iii) to conduct research, encourage research in increasing yields, preventing losses by insects, pests, fungus, etc. ; (iv) to carry on research on farm management in order to increase the efficiency of the grain growers ; (v) encourage mechanization and application of modern science and technology to foodgrain production ; (vi) to conduct surveys, maintain statistics and undertake all such steps as are necessary to keep the farmer well-informed ; (vii) to encourage subsidiary foods such as poultry, fruits and vegetables, fish, pork and other meat and take steps to increase their production and consumption ; (viii) to provide proper storage facilities ; (ix) to organise and finance super-market, and retail distribution to reduce costs to consumer ; (x) to encourage and undertake all kinds of food industries including packing, preservation and processing ; (xi) to take positive steps, to ensure balanced consumption of foodgrains ; (xii) to run Corporation's own transport, and (xiii) to undertake procurement wherever and whenever necessary.

Thus the Corporation functions as a major instrument of State policy in securing these objectives : (a) ensure a reasonable price which will induce farmers to adopt improved methods of cultivation for increasing production ; (b) ensure that consumer prices do not rise unduly ; (c) avoid excessive price fluctuations and reduce the disparity of prices between State and State ; (d) build-up a sizeable buffer stock of wheat and rice from imports and internal procure-

ment : (e) engage in rice milling, production of nutritious food and whole-sale distribution of sugar.

The Corporation has built up buffer stocks throughout the country out of surplus and imported grains ; provides adequate storage facilities, eliminates unnecessary movement of foodgrains and avoids losses due to faulty storage ; enters the market and undertakes purchase, storage, transport, distribution and sale of foodgrains in the country ; helps ensure remunerative prices to farmers and prevents exploitation of scarcity conditions by unscrupulous elements as it has the power to requisition stocks at fixed prices.

The activities and nature of operations of the Corporation differ from State to State. In some States like Andhra Pradesh it acts as the agent of the State Government for the purchase, storage and distribution of rice in the State ; in Orissa it effects its purchase of rice for other states. In Assam it purchases, stores and distributes rice and paddy on behalf of the State Government. In some other States, it acts only as one of the several procurement and purchase agencies operating in the State.

The Corporation started initially in 1965 with the purchases of rice only so far as the domestic supplies are concerned. But later on it also engaged in procurement of wheat, jowar, maize, bajra, gram and other products. The Corporation moved in inter-State trade in 1965-66, 5.06 lakh tonnes of rice and 65,500 tonnes of wheat. In 1966-67, these figures rose to 6.3 lakh tonnes and 1.77 lakh tonnes. In 1967-68 over 9.11 lakh tonnes of rice and 12.44 lakh tonnes of wheat were moved. In 1970-71, the inter-State despatches of foodgrains were of the order of 52.55 lakh tonnes. In 1973-74 it purchased about 51 lakh tonnes of foodgrains. During 1964-65 the Corporation imported 7.9 lakh tonnes of foodgrains. This quantity increased to 12.8 lakh tonnes in 1965-66 and 23.5 lakh tonnes in 1966-1967. It was 38.7 lakh tonnes in 1968-69 ; 36.8 lakh tonnes in 1969-70, 35.6 lakh tonnes in 1972-73 and 35.5 lakh tonnes in 1973-74. The storage capacity owned by F. C. I. at the end of March 1973, stood at 69.1 lakh tonnes. By end of September 1977, it stood at 1.95 crore tonnes.

The Government has undertaken various measures for the last few years to meet the food shortage in the country. The measures undertaken may be discussed under these heads :

- (a) Procurement
- (b) Support. Procurement and Issue prices
- (c) Distribution and Rationing
- (d) Buffer stock
- (e) Imports ; and
- (f) Other measures

Procurement

The Government procures a part of the domestic production to feed fair price shops and to build up its stock. Vigorous efforts are made to maximise procurement both in surplus and deficit states with the objective of meeting the requirements of the public distribution system.

Different States adopt different methods of procurement. Generally four methods are adopted.

(i) One is *monopoly purchase-cum procurement* of paddy and rice adopted by the Assam, Maharashtra and Orissa Governments. Under this the Government alone procures foodgrains from the agriculturists. During 1973, the Central Government nationalised the wholesale trade in wheat and undertook procurement through F.C.I. departments of the State Governments and Cooperative societies. But for administrative and political reasons this policy was given up in 1974. In Orissa the system was replaced in 1974-75 by a levy on producers and millers including hullers.

(ii) Under the second method producers are under compulsion to sell to the Government a part of their produce. The levy increases with the increase in the amount of foodgrains produced by farmers. Procurement through levy on producers prevailed in Karnataka, Kerala, West Bengal, Gujarat and Andhra Pradesh.

(iii) Under the third method, levy is imposed on millers and dealers in foodgrains 'who are required to surrender a part of their stocks to the Government.' This system was adopted in states like Andhra Pradesh, Bihar, Haryana, Kerala, M.P., U.P., Punjab, W. Bengal, Tamil Nadu and Rajasthan.

(iv) Under the fourth method purchases are made by the Government in the open market as in Haryana and Punjab. At some pre-determined prices, the Government has the prior right to purchase foodgrains before any one else can enter the market.

In regard to wheat, in the surplus states (Punjab, Haryana, M.P., Rajasthan and U.P.) a 50 per cent levy on purchases of wheat by licensed dealers in the regulated markets was imposed in 1974-75 rabi season. A levy on producers of wheat was introduced in Bihar in May 1974 and in Rajasthan in June 1974. In respect of coarse cereals, a levy on producers ranging from 25 per cent to 50 per cent of production was levied in almost all states. In Maharashtra, besides levy procurement was also made by open market purchases through cooperatives.

The amount of foodgrains procured varies from year to year, but there has been an increasing trend. The amount procured was as little as 0.04 million tonnes in 1956. It was as high as 8.86 m. tonnes

in 1971. The total procurement of food grains was 6.7 million tonnes in 1970; 8.9 m. tonnes in 1971; 7.7m. tonnes in 1972; 8.4 m. tonnes in 1973; 5.7 m. tonnes in 1974. 10.6 m. tonnes in 1975; 10.2m. tonnes in 1976. During the rabi season 1977-78, the procurement wheat has generally been under price support operation to protect the interest of the cultivators.

In the following tables the procurement of foodgrains, rice and wheat has been shown.¹

Procurement of rice and wheat (000 tonnes)

Year	Rice	Wheat
1972-73	2,706	5,006
1973-74	3,887	4,531
1974-75	3,795	1,955
1975-76	6,322	4 049
1976-77	4,383	6,602
1977-78	—	5,162

Procurement of Rice
(November—October)*

(Thousand Tonnes),

States	1970-71	1971-72	1972-73	1973-74	1974-75	1975-76	1976-77
Andhra Pradesh	466	267	326	696	888	1380	465
Assam	83	87	89	112	125	257	152
Bihar	30	29	56	57	61	60	42
Gujarat	—	—	6	18	12	27	32
Haryana	252	316	277	417	278	480	632
Jammu & Kashmir	30	41	25	39	25	41	33
Karnataka	16	42	51	98	123	265	65
Kerala	71	61	57	44	42	32	20
Madhya Pradesh	551	428	243	208	151	292	175
Orissa	257	169	209	214	55	234	118
Maharashtra	236	182	66	161	87	52	37
Punjab	525	771	754	943	970	1201	1504
Tamil Nadu	118	161	131	272	439	888	173
Uttar Pradesh	259	296	227	429	282	762	691
West Bengal	266	254	176	159	225	301	169
Others	17	12	13	19	27	50	71
Total	3,197	3,116	2,706	3,887	3,795	6,322	4,383

*Except in case of Punjab, Haryana, & Tamil Nadu where it is October-September.

1. R. B. I. Report on Currency and Finance, Vol. I, 1974-75 p. 12 ; p. 15 and p. 17.

Sources :—(1) Bulletin on Food Statistics, Government of India.

(2) Department of Food, Ministry of Agriculture Irrigation, of Government of India.

Procurement of Wheat (April-March) (000 tonnes)

	1970- 71	1971- 72	1972- 73	1973- 74	1974- 75	1975- 76	1976- 77
Bihar	—	13	2	50	2	51	101
Haryana	482	709	818	586	249	433	907
Madhya Pradesh	8	50	65	192	124	137	274
Punjab	2,368	2,938	3,179	2,707	1083	2361	2942
Rajasthan	1	154	46	146	127	185	474
Uttar Pradesh	322	1145	843	816	319	791	1711
Others	11	92	53	34	51	91	193
Total	3,192	5,101	5,006	4,531	1,955	4,099	6,602
Negligible							

Support, Procurement and Issue Prices

The Agricultural Prices Commission (appointed in 1965) fixed prices of various agricultural products. The minimum support prices are in the nature of a long term guarantee to the producers so that in the event of a glut in the market consequent on excessive increase in production or for any other reason, prices are not allowed to fall below the minimum economic level. These prices are generally announced before the starting of the season. Such prices were raised in respect of 1973-74 kharif foodgrains and minimum support price for wheat for 1974-75 marketing season was also announced for the first time since 1968-69.

The procurement prices, usually higher than the minimum support prices, are the prices at which the government purchases foodgrains for maintaining the public distribution system and for building buffer stocks.

Procurement prices of *kharif* cereals as well as *rabi* cereals were fixed for the marketing seasons of 1974-75 and 1975-76 respectively. Consequently, issue prices were revised upwards.

The minimum support, procurement and issue prices for the last four seasons are given below.¹

1. R. B. I. Report of Currency and Finance, Vol. I, p. 14.

	11	12	13	14	15	16	17	18	19
Paddy		74.00			74.00			74.00	
Rice		104.00	135.00		117.00	135.00		117.00	135.00
		125.00	172.00		127.00	172.00		126.00	172.00
Wheat (*)		105.00	125.00		105.00	125.00		110.00	125.00
Jowar		74.00	86.00		74.00			74.00	
Bajra		74.00	86.00		74.00	86.00		74.00	86.00
Maize		74.00	86.00		74.00			74.00	
Ragi		74.00	86.00		74.00			74.00	

Distribution of Foodgrains

To meet deficit of foodgrains and the needs of the vulnerable sections of the population, several measures have been taken to ensure fair distribution of foodgrains. *First*, the country was divided into several zones with a view to making each zone as self-sufficient as possible, to ensure easy availability of foodgrains within each zone and to make up the shortfalls of deficit zones from surplus ones. For this purpose three steps were undertaken. One was that each zone was constituted on the principle that it should contain some surplus areas and some deficit areas within the zone as also to reduce the cost of transport. *Two*, within the region, the movement of foodgrains was made almost free. This was done to eliminate the transportation of foodgrains over long distances in the country to meet the needs of the deficit areas to carry foodgrains of surplus areas. *Three*, private traders were prohibited from moving foodgrains from zone to zone. The movement alone did it to keep a track of inter-zonal movement of foodgrains. This was to prevent any sort of hoarding or holding of foodgrains or the carriage of foodgrains to wrong places.

Between 1961 and 1967, the number of fair price shops increased nearly three times from (47,400 to about 1.37 lakhs in 1967). The quantity of foodgrains distributed also increased from about 40 lakh tonnes in 1960 to 141 lakh tons in 1966, and remained at a high level of 130 lakh tonnes and 110 lakh tonnes in 1967 and 1968 respectively. The number of fair price shops was 1.21 lakh in 1971 and 1.05 lakh in 1972. The number increased to 2.07 lakh in 1973 to 2.13 lakhs in 1974, and to 2.46 lakhs in 1977. The quantity of foodgrains distributed during 1971 was 78 lakh tonnes, 105 lakh tonnes in 1972, 114 lakh tonnes in 1973, 107 lakh tonnes in 1974, 113 lakh tonnes in 1975, 92 lakh tonnes in 1976 and 117 lakh tonnes in 1977.

Statutory Rationing

Statutory rationing through a public distribution system is undertaken in case of severe shortages of foodgrains. If the supply situation is somewhat favourable informal rationing which amounts to no rationing, is undertaken. Except in few places like Calcutta, and Asansole-Durgapur, group of industrial towns and Bombay, where statutory rationing of rice alone is undertaken, in the rest of the areas a state of informal rationing prevails. Under this, along with fair price shops, distribution through private traders exists. This system is intended to keep down demand under control. Frequently in the past the per capita ration was reduced in case of shortages and increased in case of an easy supply situation in respect of foodgrains. Many times, the government policy swung from complete control to complete decontrol of foodgrains, but for a long time the policy of informal rationing has prevailed.

During the 1975-76 rabi marketing season, the system of open market purchase by public agencies at the procurement price of Rs. 105 per quintal for all varieties of wheat was introduced and the 50 per cent levy on purchases by the licensed dealers in the surplus states imposed during 1974-75 season was withdrawn. However, in order to maximise procurement, an incentive bonus scheme for supply of wheat to the central Pool was introduced. For the 1976-77 rabi season the procurement price of wheat was maintained at Rs. 105 per quintal for all varieties of wheat and the incentive bonus scheme introduced during 1975-76 was continued. The issue price of wheat released from the central Pool for public distribution was retained at Rs. 125 per quintal. During 1977-78, rabi marketing season, the procurement price of wheat of all varieties has been raised to Rs. 110 per quintal. The incentive bonus scheme on wheat has been discontinued. The issue price of wheat released from the Central Pool has been maintained at Rs. 125 per quintal. The zonal restriction on the movement of wheat and wheat products has been withdrawn and there is now free movement of these from one part of the country to another.

For the kharif marketing season 1977-78, the procurement price of coarse quality of paddy which was Rs. 74 per quintal previously has been raised to 77 per quintal.

The population covered under statutory and informal rationing was about 160 and 369 million in 1972 as against 152 and 284 million at the end of 1971. In 1973, the population covered under statutory rationing was 171 million. In 1974, it was 178 million, and in 1977, it was 200 million. Statutory rationing has been in force in Calcutta and Asansol-Durgapur group in wheat and rice only. Informal rationing of foodgrains continued in other areas, including Bombay city.

Buffer Stock

With a view to imparting stability to the country food situation, the Government has decided to build up a buffer stock of about 12 million tonnes by 1978-79. The increased distribution of foodgrains during 1972 to 1974, despite increase in imports during 1973 and 1974, led to a considerable depletion of stocks. The total physical stock with the Central and State Governments stood at 3.4 m. tonnes in 1972 ; 2.8 m. tonnes in 1973 ; 2.4 million tonnes in 1974 ; 4.8 million tonnes at the end of June 1975. It increased to 19.0 crore tonnes by August 1977.

Imports

In order to meet deficiencies in domestic production and procurement, the Government has been importing sizeable quantities of foodgrains from time to time. Net imports have varied considerably, depending upon the shortfalls in domestic supplies. These were as high as 10.34 million tonnes. From 1964 to 1968, over 5

million tonnes were imported. In 1972, the quantity of imports was 4.45 lakh tonnes, but it increased to 36.14 lakh tonnes in 1973; 48.74 lakh tonnes in 1974, 75.07 lakh tonnes in 1975. In 1976, it fell to 64.4 lakh tonnes and further to 4.8 lakh tonnes in 1977.

Provision of Storage facilities

Storage facilities are provided to the farmers and traders by Central and State Warehousing Corporation in addition to the Government's own storage programmes. The storage facility owned by government and Food Corporation of India has been increasing appreciably. It was of the order of 231.6 thousand tonnes in 1955-56 : 696.0 thousand tonnes in 1960-61 ; 1953.2 thousand tonnes in 1965-66; 3451.5 thousand tonnes in 1970-71. In 1971-72, 1972-73, 1973-74 and 1974-75, it was of the order of 4044.6 ; 4759.2 ; 5146.8 and 5308.0 thousand tonnes respectively.¹

Movement Restrictions on Foodgrains

With the object of promoting regional self-sufficiency or conserving the supplies for local consumption and reducing cross movement, and to check undue rise in prices in surplus areas and thereby help the procurement effort, restrictions on the movement of rice/paddy has been in force. The single-state wheat zones continued in April 1973. However, in accordance with the modified wheat policy for 1974-75 rabi season, the Governments of surplus states of Punjab, Haryana, U. P., M. P. and Rajasthan were given favour to issue permits to private traders for the export of levy-free wheat. All restrictions on the movement of coarse cereals were lifted from 7th March 1974.

Other Measures

Increasing use is being made of co-operative societies and consumer co-operative and stores are being established in addition to shops in industrial establishments employing more than 400 workers.

Retail prices of foodgrains have also been regulated by State Governments in certain areas.

A programme for intensification of rice production in 40 selected districts on 'package' basis has been initiated. A dry farming programme for increasing production of millets and pulses has also been undertaken. The 'package' approach has also been extended to cotton, oilseeds and other commercial crops. Programmes have also been drawn up for the intensive development of milk, egg, meat and short-term crops.

The principal technical programmes for increasing agricultural production that have been undertaken are : minor irrigation ; soil conservation ; dry farming and land reclamation ; supply of manures

1. Ministry of Agriculture and Irrigation, *Report for 1974-75*, p. 73.

and fertilizers ; seed multiplication and distribution ; plant protection ; and adoption of scientific agricultural practices.

EVALUATION OF THE GOVERNMENT'S FOOD POLICY

In sum, since the initiation of planning in 1951, various measures have been taken, by the government, for stepping up production of foodgrains. The main measures being :

- (i) Increase in irrigation facilities through the construction of large multipurpose irrigation projects, and medium and minor irrigation schemes. The total area irrigated increased from 2.09 crore hectares in 1950-51 to 3.36 crore hectares in 1974-75 i.e. the net area irrigated by 1.27 crore hectares.
- (ii) Extension of area under foodgrains, by bringing more land under cultivation and by multiple-cropping. The net area sown increased from 11.8 crore hectares in 1950-51 to 13.8 crore hectares in 1974-75 i. e., it increased by 2.00 crore hectares. The area under foodgrains rose from 101,195 thousand hectares in 1950-51 to 126.959 thousand hectares in 1973-74 i. e. 25.7 per cent.
- (iii) Use of high yielding varieties of seeds, chemical fertilizers, pesticides, etc., particularly, since 1965-66, the area under high yielding varieties Programme increased from 9.20 m. hectares in 1968-69 to 37.00 m. hectares in 1977-78 i. e., by more than four times.
- (iv) Other measures such as land reform, consolidation of holdings, extension of cooperative credit, and cooperative farming, etc., As a result of all these measures, production showed a considerable increase, from 55.0 million tonnes in 1950-51 to 111.57 million tonnes in 1976-77. In other words, the index of foodgrains production rose from 67.4 in 1950-51 to 151.1 in 1975-76 (with 1961-62—100).¹

However, it may be noted that the efforts of the government were confined to the production of foodgrains. Very little has been done to increase the production of non-cereal food items like milk, milk products, meat, fish, eggs, fruits and vegetables. Now attention is being given to their production.

Further, although production of foodgrains has increased, yet due to an increase in population, the picture regarding the per capita availability of foodgrains has not been satisfactory. In 1956, the per capita availability was 430.9 gms. per day. It rose to 480.2 gms. in 1965 and it was 438.7 gms. in 1977. However, it may be noted that since 1968, the per capita availability of foodgrains has remained more or less the same, except during 1973, 1975 and 1977 since then, there has been a fall in imports, from 1.39 million tonnes

1. *Indian Agriculture in Brief*, 1977, pp. 12-13. *Economic Survey*, 1977-78. p. 68.

in 1956 to 0.48 m. tonnes in 1977, although during drought years it has been as high as 8.66 million tonnes in 1967 and 7.39 million tonnes in 1975.

It is worth noting that there has been less of instability in the production of foodgrains from year to year (except from 1960 to 1967), due to development of agricultural technology and green Revolution.

However, there has been some dark side also of the governments food policy. This would be clear from the following facts.

Disparities in the distribution of foodgrains, both as regards the per capita availability among the states and also unequal distribution of the superior and inferior cereals among the poorer sections of the population. This first fact is evident when it is seen that the per capita availability of foodgrains range from as high as 1357 gms. per day in Punjab, and as low as 148 gms. in Kerala (in 1971-72). In between lie other states, e. g., Bihar 368 gms. Gujarat 368 gms. Andhra Pradesh 345 gms. Assam 811 gms. and Maharashtra 228 gms. This has led to an ill-balanced standard of living among the people. What is needed is that there should be equitable distribution of foodgrains. The second fact is proved when it is noted that though wheat production did increase (as evident from the index numbers of wheat production) from 60.9 in 1960-61 to 132.1 in 1971-72 and to 161.20 in 1976-77. During this period, the index number of inferior cereals rose very slowly from 87.8 in 1960-61 to 114.7 in 1970-71 but it fell to 105.0 in 1976-77. The same has been the case with the production of cereals. The index number rose from 104.4 to 112.3 but it fell to 98.8 during the same period. This means that an important source of protein (in the form of pulses) is not adequately available to the poor who are purely vegetarian. Another distressing fact has been that not only the production of inferior cereals and pulses did not increase satisfactorily, their prices also have risen sharply than those of wheat and rice. On the 1970-71 basis, the price index of rice was 115, of wheat 103, and of pulses 118 in the last week of 1971-72. But these rose to 157, 159, and 171 respectively in the last week of 1976-77.

Another important distressing fact is that the increase in production of foodgrains has been largely concentrated in earlier years, when green Revolution and new agricultural technology was introduced, than in the later years. This is evident from the fact that in the last 5 years (1971-72 to 1976-77) the increase in the index of foodgrains production rose by 5.1 point (from 111.4 to 116.5) in case of cereals the improvement during the corresponding period was just a little higher at 5.7 point.

In case of rice there was an actual fall by 0.7 point. The index number of pulses increased marginally from 97.9 to 98.9. This slow increase trend has been due to absence of the use of new

technology in small farms because of inadequate land reform and non-availability of inputs, non-extension of irrigation facilities and lack of dry farming new technology.

Finally, it may be noted that the prices of foodgrains have increased sharply than the prices of other goods. For example, with 1961-62 as the base year, the wholesale price index in December 1975 for all commodities was 294, for manufactures 253, for agricultural commodities 297, and for foodgrains 329. Among the principal foodgrains, the price index for rice was 309, for wheat 331, and for pulses 412 with 1970-71 as the base year, the same situation is visible. When the wholesale price index reached 182 in 1976-77 the index for manufactured goods rose by 62 points (between 1971-72 and 1976-77) from 115 to 117, whereas the index of food articles increased from 101 to 165, i.e. by 64 points; and of the foodgrains prices index for rice increased from 105 to 187 and of wheat from 103 to 159 and of pulses 118 to 171. This clearly reveals that the increase in the prices of foodgrains has been very sharp.

In sum it may be observed that inspite of various corrective measures, undertaken by the government, the food problem still remains complex and unsolved.

Remedial Measures to Meet Food Shortage

"Solving the food problem involves a stupendous task. It is immense in terms of vast operational areas, a huge population, treatment of a chronic state of long duration and frequent occurrences of famines and floods and other climatic hazards. It is immense in terms of absolute magnitude of physical targets in terms of human efforts both scientific and technological and in terms of financial requirements. During the last 125 years two very strong measures were adopted by the Government to overcome the seriousness of the food problem. These were : the development of railways and roads so that the surplus foodgrains could be easily and quickly transported to deficit areas ; and the irrigation system so that more land could be made to yield agricultural production. Both these measures were successful in holding in check the situation but only for a few decades each time." For the last quarter of the century, the situation has assumed serious proportion and gone out of control. As such, it requires much stronger measures to cope with.

There are three principal ways in which the food supply can be increased, viz.

(i) **By Reducing the Losses.** There are possibilities of substantial saving in the losses in the field and in storage in warehouses and home through the wide-spread use of insecticides and improved storage and processing methods and scientific preparation of food.

(iii) **By Extending the Area under Plough.** Of the total geographical area of 328.05 m. hectares or somewhat over 40 per cent is

cultivated. In addition, the fallow lands and culturable wastes total 35.34 m. hectares making an aggregate of about 98.9 m. hectares of potential agricultural land. 4 per cent of the total area is under grass and 15 per cent under forests. Most of the fallow lands are located in areas of low rainfall or hilly topography, in which a certain portion of agricultural land has to be kept fallow. Possibilities of expanding cultivation in the culturable wastes are also limited because large areas among these can be reclaimed only at very high costs and with heavy equipment and enterprise. A recent estimate made by the Wasteland Survey and Reclamation Committee had disclosed that only 0.8 m. hectares of wastelands located in blocks of 100 hectares or more can be brought under cultivation in nine different states. This figure will certainly increase considerably when areas located in blocks of less than 100 hectares are added. This will entail heavy capital expenditure. Besides, it will be necessary to provide an efficient administrative organisation for technical services and an appropriate institutional set-up in order to ensure a sustained functioning of productive enterprise in the areas so brought under cultivation.

Large blocks of wastelands can, however, be brought under use through a suitable agency by the Government. This would ensure "direct control over production so that the farmers' willingness to sell does not affect the Government stock policies." This measure would facilitate production of foodgrains by modern techniques of production on these farms and they would, besides generating the marketable surplus, serve as model farms with a considerable demonstration value. Some idea of their contribution to output can be had from the fact that given a proper development of these lands, output per acre can be raised to 4,000-5,000 kgs. At this rate about 4 to 5 m. tonnes of foodgrains can be produced.

As regards blocks of wastelands in smaller sizes, if it is assumed that one quarter of available wastelands are in sizes of acres and above, something like 20 m. acres could be brought under plough. The additional increase in foodgrains could be of the order of 3 to 4 m. tonnes, if one-fourth of the total wasteland is cultivated. Such small pieces of land may be identified and given to individual farmers, especially landless labourers, for cultivation. Finance and other assistance also need be given to them.

Thus, the possibilities of bringing fresh land under cultivation are very limited, partly because of the limited area of culturable waste which can be easily brought under cultivation; and partly because the capacity of extension of cultivation in terms of the potential and the application of science and technology by farmers in fields and even the government is limited in specific time during which the population remains pressing hard continuously. Besides, the depletion of land resources under a heavy pressure of population is rendering the land resource position more and more precarious.

The limits of extension are almost reached over by far a major part of the country especially in the plains area including both the Indo-Gangetic and the coastal plains, which is agriculturally good area (the percentage of net-cultivated to cultivable land varies from 65 to 95). However, in the Central and North-Western regions (which are mainly the millet zones) and agriculturally less suitable, extension may be possible. But because of various difficulties, lack of water supply and other factors it is difficult and must involve time and considerable cost. And even if such areas could be put under cultivation, the increase in the cropped area could make only a limited contribution to increasing agricultural production and the main reliance for the latter has to be on intensification of agriculture and increasing yields on the existing cultivated lands.

(iii) *Intensive Cultivation.* For sustained and increased productivity, it is necessary that all lands are used according to their land use capability, i. e., the use for which they are best suited. Areas which are not suited for agriculture should be used for forestry and grazing, etc., while agricultural land should receive appropriate land improvement and conservation measures to raise their productivity.

As a result of regional specialisation in agricultural production the country has come to be divided into "Surplus" and "Deficit" areas in respect of production of foodgrains. While some states like W. Bengal, Kerala, Maharashtra, and Gujarat are deficient in foodgrains but surplus in commercial crops like jute, cotton, oilseeds and groundnuts, others like Punjab, Rajasthan, Haryana, M. P., Orissa and Andhra Pradesh have considerable surplus in foodgrains.

There are enormous possibilities of increasing yield per hectare of foodgrains. The use of fertilizers, and improved seeds and provision of irrigation facilities are the most important factors which contribute directly to increases in yields. It may be noted that about 41 per cent of the increase in production during 1956-61 came from fertilizers, 27 per cent from irrigation and 13 per cent from improved seeds. These three sources accounted for 81 per cent of additional production during the period.

The need for greater use of fertilizers is brought out by about 1,70,000 soil tests. "The tests indicated that almost all soils must have additional nitrogen, about 85 per cent additional phosphorus and 63 per cent additional potash, if crop yields are to be increased from the present low level by 50-100 per cent. It is this factor that limits production than any other single factor.¹ As brought out by Richardson, the average response of rice to fertilizers in India is about 590 lbs. of paddy per acre from an application where needed,

1. Williams, M. S. and Coustan, J. W. *Crop Production Levels and Fertilizers Use*, F. A. O. 1962, p. 9.

30 lbs. each of nitrogen and phosphate per acre. The average direct response from irrigated wheat fertilization is estimated at 430 lbs. per acre, about 45 per cent above underfertilized yield.¹ These instances show that a much greater use of fertilizers offers the surest way to increase the yields of foodgrains in India.

Irrigation is another factor responsible for increasing production. All available water resources—surface and underground—need be exploited for irrigation, generation of power and domestic uses. In areas of deficient rainfall like Rajasthan, Gujarat, Maharashtra and M.P., where surface water resources are too meagre or non-existent, reliance should be placed on exploitation of groundwater for tube-well development. *Secondly*, a well-coordinated 'water use plan' should be drawn up for utilization of our potential. There should be synchronization in the programmes for construction of head works, canals, distributories, water courses and field channels so that irrigation waters can be passed down to the cultivator's fields about the same time they become available to the works. *Thirdly*, minor irrigation need be developed further. The principle of supplemental irrigation to tide over the deficiency of the water supply of the irrigation system and to help in introducing double and multiple-cropping should be accepted. If the programmes of minor irrigation projects are carried out effectively, we may expect the proportion of irrigated area to gross area cropped to rise to more than 25 percent.

Another important input which determines the levels of productivity in agriculture is the quality of seeds used. The strategy of increasing food production is based on the extension of high-yielding varieties responsive to heavy doses of fertilizers and the package of improved practices in selected areas. The high yielding varieties of paddy can give yields as high as 5,000-6,000 kgs. per hectare and that of wheat about 5,000 kgs. Similarly, hybrid varieties of maize, jowar and bajra have been found capable of giving very high yields under favourable conditions.

Other Measures to be Adopted

Increasing Subsidiary Foods. Fruit farming and vegetable growing has good prospects provided that communication, means of transport and marketing organisation are improved and facilities of cold storage, canning and bottling are developed. Productivity of land under fruits and vegetables can be doubled with intensive methods of horticulture.

The area now devoted to inferior cereals (like jowar, bajra, barley and cheaper millets) should be devoted to more nutritive cereals like rice and wheat and pulses to provide adequate proteins in diet. An increased production of root-vegetables (potatoes, radishes, beet-roots, onions and parsnips) many of which are not only

1. Richardson" H. L. "What Fertilizers Could do to Increase World Food Production", *International Rice Commission Newsletter*, quoted in Williams and Coustan.

rich in carbohydrates but also in alkali, Vitamin C, and iron etc., should be pushed up. Similarly, land may be made to yield more starch in the form of potato or sweet-potato, which may cut down the production of rice in India. To remove vegetable protein deficiency in the diet, a wide variety of pulses and beans and soya should be grown, as they are rich in Vitamin B.

Eggs provide good protein, vitamins, calcium, phosphate and iron. Their total production as well as efficiency of production can be increased greatly by good feeding and management and proper disease control. Further, the establishment of processing plants for fallen animals can, by providing animal protein feeds, do much to further poultry production.

Meat is the most costly source of animal protein. Quite a large proportion of Indian population prefers to take meat provided it is cheap. Therefore, production of pigs and poultry meat should be encouraged. Pigs are quick producers of meat. They also fit into the pattern of intensive farming. Their high fertility, ability to raise large litters, high growth rate, high conversion efficiency of feed into animal proteins and above all, the fact that they do not present particular difficulties in acclimatizing, justify measures to increase their production.

Milk is very rich in vitamins, calcium and phosphorus, protein, etc. Its consumption and production should be speeded up. Immense possibilities exist for increasing the productivity of the cattle. Pepperal (1946)¹ and Kay (1946)² have observed that an immediate increase of 50 per cent can be obtained by proper feeding of village cattle and then an increase much beyond 50 per cent could take place by proper breeding. For better feeding green manures are particularly effective in increasing the initial yields while concentrates are effective in securing higher increases. In this connection it is also necessary that useless, unproductive and old cattle should be slaughtered so that the specie of the cattle does not deteriorate.

Fish is a protective food rich in proteins, vitamins and organic elements. Its consumption needs be improved. The Indian Ocean expedition has estimated that only 8% of the fish available along the coast of India is being caught at present. In other words, the supplies of sea fish could be increased 20 times if this source is exploited fully, in the way in which it is exploited by the people of Norway, Japan, Canada and Western European countries. The supplies could be increased even more by adopting presently known methods of fish culture. The dams and reservoirs in our river valley projects offer another source of fresh water fisheries of great magnitude. What can be done in this direction is demonstrated by the experience on the Tungbhadra Dam, where supplies of fish (for fish culture) have increased within a few years from 700 pounds to 3,00,000

1. R. A. Pepperal. *The Dairy Industry in India*, 1946

2. M. D. Kay, *Report on Dairy Research, Dairy Education and Dairy Development in India*, 1946.

pounds. Some of the slower moving rivers offer good possibilities of culture of algae which are rich in protein food. Utilization of these vast resources of sea and rivers will increase food supplies and raise nutritional standard of large segments of our population, besides reducing the pressure of demand for cereals.

Protein can also be available from a large number of leaves, single-cell micro-organisms grown on substrate such as petroleum and algae. Besides, groundnuts, cottonseed, soyabean, sesamum etc. are rich in proteins. Their consumption is to be increased.

Change in Food Habits. At present an average Indian consumes more of cereals and less of other protective food. Efforts should, therefore, be made to reduce the intake of cereals by substitution thereof by green leafy vegetables, fresh fruits like tomato, mangoes, papaya, carrots, oranges, etc. which are an important source of protein.

The diet in the wheat zones should be enriched with fruits and leafy vegetables ; while the diet of the people in the rice zones should be supplemented with wheat, milk, pulses, fish and eggs. The same should apply to tapioca and millet eating areas.

Special attention should be paid to the hard-working sections of the population—especially the working classes, peasantry, whose calorie requirements should be determined and who should be given sufficient protein and calories in the diet. Infants, growing children, expectant and nursing mothers' diet also needs great change with the addition of milk, eggs, fruits, etc.

Under-milled rice is of great nutritive value than highly milled rice in respect of vitamin B and other factors including protein and mineral salts, and therefore, rice diet should preferably be supplemented by whole wheat or millet.

Production Incentives. In order to exploit fully the technological possibilities of increasing agricultural production the producers must have the necessary capacity and willingness. Apart from supplying to them technical guidance and financial assistance, the farmers must be assured of economic returns for their labour and initiative. This incentive can be given through rising prices. To be completely satisfactory, therefore, *food prices have to be low enough to reduce the pressure on cost of living and on wage demands, high enough to maintain output and incomes in agricultural sector, not so high as to induce the producers to reduce the share of the output offered in the market and finally, stable enough to induce distributing changes in the trader's inventories.*

Reduction in Fertility At present roughly seven children are born to married couples during the entire reproductive span, out of which five survive. Efforts should be made to have not more than three surviving children per married couple. This will not solve our

problems but will go a long way to alleviate the pressure of population. May be in course of time, we can strive for a two-child family. Reduction in fertility can be brought about only when families are planned and when females bear children not by chance but by choice. This can be achieved either through the use of contraceptives or through sterilization. Of these two, the latter should be preferred, for it is 40 per cent less costly and the benefit is that fertility could be resorted to by a simple operation. Further, one who does not like this may take to contraception. It has been found out, through surveys, that 60 to 70 per cent of the population is in favour of family planning, no matter what the method adopted is. Religion does not come in their way. The Government should not lay any undue emphasis on any one of the methods (it should be entirely an individual choice and should be left to them) but it should largely depend on publicity, propaganda and education in order to motivate people to take to contraception. Social traditions should change through sex-education among the people, by convincing arguments and effective communication of the fact that children are not the act of God over which humanity has no control but they are their own creation on whom a conscious check could be put.

The implementation of these suggestions involves long-range efforts covering the whole field of agricultural and economic development and social conditions. It pre-supposes an increase in the purchasing power of the people, an all round development in the standard of living, a change in food habits and our social traditions, limitations of unbridled growth in population and an all-out drive to increase production of protective foods. Two facts deserve special consideration. *First*, agriculture should be reorganised on scientific lines, and *second*, a curb should be put on the rapidly increasing population. Both these measures should go hand in hand.

We would do well to quote David E. Lilienthal (the former chairman of T.V.A. and renowned expert on farm development). He gave his views (Oct. 1971) about world survey on agriculture which deserve careful consideration. He listed seven points which developing nations should bear in mind in planning food production drives. He said it was no use continuing to treat farmers to an early 20th century kind of extension services, or listening to experts who have learnt nothing new in 20 years, or who spent their lives writing endless surveys and reports steeped in sterile intellectualism and "ivory tower" economic theories. His advice was :

"Treat feeding people for what it is : a business—not a mystique, and not primarily an opportunity for social reform and uplift.

Producing food is a business. People who raise and process and distribute food are first and foremost just another kind of private

businessmen. Give the farmer a chance for a profit and he will do most of the rest.

Don't over plan. Give the producer, whether he is a farmer corporate farm manager, a chance to exercise spontaneity.

To really lick the food problem, farming must be done on a large scale. Bigness is as important an essential for food production as it is for mass production of other consumer goods.

The Government must believe that it is in the public interest that farmers and food producers should be allowed to make money and even to get rich, if they can. If they get too rich at the expense of others, tax them, but do not dry up the driving force by too many Government controls.

Food production must not be treated as a happy hunting ground to advance the professional prestige of scientists and economists. Food production is simply part of the business of getting food to people, changing that is, manufacturing what is grown into other forms, and making distribution as much as respected skill as developing new strains of wheat."

Appendix 1
Production, Imports and Availability of Foodgrains in India

Year	Population (in Million)	Rice	Wheat	Production (million tons) Other Cereals	Total Cereals	Net Imports (million tonnes)	Net per capita availability (in tonnes)	Availability Grammes per day
1950	357.5	52.2	6.8	18.7	50.7	2.16	56.1	429.9
1951	363.3	22.1	6.8	16.9	45.8	4.80	52.4	295.0
1952	369.4	22.7	6.3	17.5	46.5	3.93	52.0	384.6
1953	375.8	24.4	7.6	19.0	51.9	2.04	56.6	412.7
1954	382.6	29.8	8.1	23.3	61.2	0.83	63.9	457.9
1955	389.8	26.6	9.1	23.4	59.1	0.60	63.2	444.0
1956	397.5	28.7	8.9	20.0	57.6	1.39	62.7	430.9
1957	405.6	0.3	9.5	20.5	60.3	3.61	66.2	447.2
1958	414.2	26.6	8.0	21.9	56.5	3.22	61.8	408.8
1959	423.2	32.1	10.0	23.5	65.6	3.86	72.4	468.5
1960	432.7	31.7	10.3	23.0	65.0	5.13	71.0	448.2
1961	442.6	34.6	11.0	21.8	69.4	3.49	75.6	467.5
1962	453.1	35.8	12.1	23.3	71.2	3.64	76.4	463.0
1963	461.9	33.4	10.8	24.6	68.8	4.55	74.8	441.9
1964	475.2	37.0	9.8	23.8	70.6	6.26	78.1	448.9
1965	486.8	39.3	12.3	25.3	76.9	7.45	84.5	475.8
1966	498.9	30.6	10.4	21.4	62.4	10.34	73.5	403.5
1967	511.3	30.4	11.4	24.1	65.9	8.67	73.9	395.9
1968	524.1	37.6	16.5	28.9	83.0	5.69	86.8	452.1
1969	538.9	39.8	18.6	25.2	83.6	3.85	86.8	437.2
1970	547.2	40.4	20.1	27.3	87.8	3.59	89.4	445.2
1971	550.8	42.2	23.8	30.6	96.6	2.03	94.4	455.0
1972	562.5	42.7	26.4	24.4	93.5	0.50	96.2	469.1
1973	574.2	39.2	24.7	23.2	87.1	3.59	88.8	423.7
1974	586.1	44.1	21.8	28.8	94.7	4.83	96.8	452.2
1975	597.9	39.6	24.1	36.1	89.8	7.39	89.2	408.6
1976	609.3	48.7	28.9	29.4	107.1	6.44	102.1	457.8
1977	620.1	42.8	29.1	28.5	100.4	0.88	99.3	438.7

(Economic Survey for 1971-72 and 1977-78).

Appendix 2
Food Consumption Pattern in different States of India (1955-56) (Grams per person per day)

State	Rice	Wheat	Other cereals and millets	Total cereals	Pulses	Milk and milk products	Meat fish and eggs	Leafy vegetables	Other vegetables	Fruits	Fats and oils	Sugar and jaggery
Andhra Pradesh	316	9	134	459	29	64	10	10	32	1	11	8
Bihar	360	49	59	468	56	8	8	16	71	5	8	3
Gujarat	73	13	339	425	43	7	6	26	49	—	5	6
Himachal Pradesh	221	124	275	621	47	22	2	20	19	—	3	6
Jammu & Kashmir	212	18	359	589	8	14	3	163	63	—	9	12
Kerala	318	27	8	353	27	52	49	9	170	35	7	16
Madhya Pradesh	57	355	259	671	54	138	11	4	41	86	19	38
Tamil Nadu (Madras)	301	10	57	368	21	32	17	12	56	6	8	7
Maharashtra	232	58	96	386	34	83	19	12	59	7	15	30
Karnataka (Mysore)	51	16	446	513	50	52	4	8	25	—	11	12
Punjab & Haryana	46	393	70	509	45	230	10	32	98	6	20	76
Rajasthan	131	181	267	579	43	100	2	15	37	3	17	21
Uttar Pradesh	178	143	162	483	65	82	9	40	85	25	17	32
West Bengal	374	61	—	435	47	54	38	45	101	9	17	25
All India	205	100	181	486	41	67	13	21	65	14	12	21
Suggested allowances for a typical balanced diet				370	70	180	35	114	125	37	38	40

(Source : *Diet Atlas of India*, I. C. M. R. 1969.)

Appendix 3
Food Consumption Pattern in Different States of India (1960-69) (Grams per person per Day)

State	No. of surveys	Rice	Wheat & other cereals	Millets & other cereals	Total	Pulses	Leafy vegetables	Other vegetables	Fruits	Fats and oils	Milk and milk products	Meat, fish and eggs	Sugar and condiments
Andhra Pradesh	111	335	10	121	466	29	9	34	1	11	65	11	9
Bihar	62	267	97	89	453	42	21	69	3	8	20	8	5
Gujarat	1	73	13	339	425	43	26	49	—	5	7	6	6
J. & K.	3	212	18	359	589	8	163	63	—	10	14	3	12
Kerala	37	296	38	7	341	24	8	170	36	7	52	52	18
M. P.	2	37	356	250	652	55	4	41	86	19	138	11	38
Maharashtra	9	241	61	196	498	33	17	62	9	15	49	27	31
Karnataka	45	N.A.	N.A.	N.A.	607	26	9	19	1	2	56	3	N.A.
Punjab	22	42	378	99	519	35	44	93	13	17	317	7	97
Rajasthan	31	8	183	266	457	43	19	330	1	34	94	2	16
Tamil Nadu	114	288	11	57	356	16	8	52	5	6	26	13	6
U P	113	161	154	133	448	55	38	97	21	16	91	8	32
West Bengal	24	336	86	—	422	30	51	112	3	17	52	30	22
All-India	574	241	84	109	434	34	21	71	10	12	69	14	19

Suggested allowances for a typical balanced diet

—	—	—	—	—	370	70	110	125	37	38	180	35	40
---	---	---	---	---	-----	----	-----	-----	----	----	-----	----	----

(Source : *Diet Atlas of India*, 1971).

Agricultural Marketing

In any planned economic development programme, exchange of goods assumes a very important role in maintaining an equilibrium between production and consumption. The importance of marketing agricultural produce in India is of no mean significance. Agricultural marketing is one of the manifold problems which have direct bearing upon the prosperity of the cultivator. Agricultural marketing, in its widest sense, comprises all the operations involved in the movement of food and raw materials from the field to the final consumer. It includes the handling of product at the farm, initial processing, grading and packing in order to maintain and enhance quality and avoid wastage. Unfortunately the present system of marketing of agricultural produce in India is extremely defective and needs a thorough overhauling.

Structure and Type of Agricultural Markets

Markets for agricultural commodities may be broadly classified in two categories viz., the wholesale markets and the retail markets.

(i) The wholesale markets fall into three sub-categories, viz., :

(a) **Primary Wholesale Markets**, where the bulk of arrivals is from villages or village *hats*. These markets are periodically held, either once or twice a week or at longer intervals or on special occasions. Agricultural produce or live-stock or both are sold in these markets. There are about 22,000 such markets located mostly in the interior of the country. The *hats* in Maharashtra, Tamil Nadu and Andhra Pradesh deal in both agricultural produce and livestock, while the majority of *hats* in U.P., West Bengal, Bihar deal mainly in agricultural produce.

The area served by a *hat* or a *shandy* varies considerably. In some cases it is only one village but in others it may have a radius of 6 to 7 miles. The average attendance at the village *hats* varies from 3,000 to 5,000 in Bengal, 500 to 1,000 in Assam, 2,000 to 3,000 in Bihar and 2,000 to 5,000 in Tamil Nadu and Andhra Pradesh.¹ The

1. B. B. Mukerjee, *Agricultural Marketing in India*, 1960, pp. 32-33.

amount of produce passing through a *hat* varies from 1,000 to 4,00,000 mds. Sonapat (Punjab), Dhanduha (Gujarat), Bulandshahr, Deoband, Shamli, Ghaziabad, Ujhani, Hapur, Meerut, Khokara and Dankaur (U.P.), Kumbakonam (Tamil Nadu), Fatehnagar, Kekri, Beawar (Rajasthan), Nellore (Andhra Pradesh) are examples of primary wholesale markets.

Such markets are organised by village panchayats and every shopkeeper has to pay some rent for the space he occupies. Higgling and bargaining is a common feature. The village *bania* acts as a middleman in return for a small commission. Such markets are known as *painths* or *hats* in U. P., Bihar, Orissa and West Bengal and *shandies* in South India.

(b) **Secondary Wholesale Markets**, called *mandis* and *gunjs*, stretch over a wide area covering from 10 to 20 miles. There are about 1,700 such markets in the country. In these markets, the bulk of the arrivals is from other markets. These are usually situated in the district and *taluka* headquarters, important trade centres or near railway stations. Here transactions are generally between wholesalers or between wholesalers and retailers. Markets like Chandausi (U. P.), Kurnool (Andhra Pradesh), Tirucherapalli (Tamil Nadu), Calcutta (West Bengal), Sri Ganganagar (Rajasthan) etc. fall in this category.

These are wholesale markets held in fixed places where business is transacted daily. The produce is handled in large quantities and specialised operators become necessary for the performance of different services. In these markets produce like fruits, grains, vegetables, etc. are sold. They enjoy facilities of storage, handling and banking services and are well served by roads and railways. These markets are both decentralised and centralised, where *arhatiya* work. They are usually owned by private persons or local bodies. In Tamil Nadu they are mostly owned by District Boards, whereas in Assam, Bihar and West Bengal they are mostly private. In M. P. they are owned by municipalities.

(c) **Terminal Markets**, are those markets in which the produce is either finally disposed of direct to consumers or processors or assembled for shipment to foreign destinations or for redistribution to surrounding areas. Such markets are usually the ports, which possess sufficient warehousing and storage facilities and cover a very wide area extending over even a state or two.

It may be observed that a particular market may function as a primary wholesale market for some agricultural commodities which are produced locally and as a secondary market for other commodities. Again even for the same commodity a market may function as primary wholesale market for certain parts of the year and as a secondary wholesale market for the rest of the year.

Fairs. Besides, there are held, on religious occasions at pilgrim centres, over 1,700 fairs which deal in agricultural produce and livestock. Of these 50% deal in livestock only ; 10% deal both in livestock and produce and 40% deal in agricultural products only.¹ Produce fairs are held in Bihar and Orissa only, while livestock fairs are held in U.P., Maharashtra, West Bengal and Rajasthan. These fairs are held annually—specially between the months of October and May and the duration of livestock fairs varies from one day to 3 months. Camels, horses, bulls, donkeys, cows, bullocks, sheep and goats are usually sold in the fairs. Such fairs are organised by district officers, local bodies or private agencies.

Special Characteristics of Agricultural Products

Certain special features have an important bearing on the demands made on agricultural marketing system and organisations. Farm products tend to be bulky and their weight and volume are great for their value in comparison with many manufactured goods. The demand on storage and transport facilities is heavy, and specialised. Although some crops, such as rice and paddy, retain their quality for a long time, most of the farm products are perishable and cannot remain long on the way to the final consumer without suffering loss and deterioration in quality. Peaches, grapes, tomatoes and many other fruits and vegetables rapidly become over-ripe and decay if they are not soon consumed or kept in special storage. Meat keeps for only a short-time in hot climates. Until the advent of refrigerated ships and railcars, trade in meat and dairy products was conducted in the form of live animals. Milk is an important commodity of exceptional perishability. In hot areas without any special treatment, its effective life may be only a few years.

Processing of Agricultural Produce

After a crop is harvested and before it reaches the consumer, it is subjected to one or more forms of processing which differ for different crops and for different uses and preferences on the part of the consumer. A single form of processing may consist of more than a single operation carried out by different parties at different stages. Thus, paddy may be threshed and winnowed by the cultivator but husked by the miller, the trader or even the consumer. In more prevalent forms of processing of major crops there is a broad uniformity in this country. We indicate here, in brief, the principal methods of processing employed in respect of more important food and commercial crops.

Rice. The main form which the processing of rice takes is the husking of paddy. Sometimes rice is parboiled before it is husked. The husking may be manual as in hand-pounding, or by a power-driven machine as in rice mill. The bulk of grain is hand-pounded, only 25 per cent is processed by rice mills.

1. N. P. C. *Report of the Marketing Sub-Committee*, 1946, p. 9.

Wheat. Threshed and winnowed wheat is still covered with earth hence a large-number of labourers are employed to clean it and dress it before passing it on to the retailer or the consumer.

Oilseeds. The processing of groundnut consists in removing the kernel from the nut by mechanical decorticator or by hand shelling. Nuts for eating are generally mixed with hot sand and roasted and the kernels then taken out.

Tobacco. The operations involved in the process of tobacco are curing, sorting, bulking (for fermentation) and reconditioning, followed by bundling and packing.

Sugarcane. Sugarcane is sold for being made into sugar or *gur*. Extraction of juice from the cane is largely done in the factories. 20 per cent of the cane used for *gur* making is crushed in bullock-driven three roller iron mills and about 7 per cent by wooden or two roller iron mills.

Cotton. The bulk of the cotton produced is disposed of by the growers as *kapas*. Very little is ginned by the cultivator, he usually brings cotton to the marketing place which is sometimes the yard of a ginning factory.

Jute. The two main operations in the processing of jute are (a) steeping which involves the immersing of bundles of jute plants in running water in order to soften the tissues of the plants, and (b) the stripping of the fibre. The processing is done by the cultivator who generally engages paid labour. Each labourer strips about half a maund of fibre per day. The fibre is then left for about 2 days in the sun to dry and sold in bundles in *hats*.

Potato. The crop after harvest and before despatch to the market receives little attention in regard to preparation. After harvest they are collected in the field and stored in pits or removed to the village from where they are assembled by the whole-salers.

A large number of processing units have now been established in the cooperative sector. The structure conforms to two distinct patterns. There are units established by independent processing societies, and units established as adjunct to cooperative marketing societies. Under the first category fall the larger units such as sugar factories, solvent extraction plants, etc. Medium and small units as rice mills, oil mills, jute baling units, cotton ginning and pressing units fall under the second category. Of the 1856 processing units organised by the end of 1973-74, 1544 units were established. The number installed was 1394. By March 31, 1977, 2204 units were organised of which 1,741 units were installed.

Methods of Sale

Sales of agricultural commodities are usually effected in one of the following ways :

(1) **Under Cover or Hatta System.** This system is even now very common all over India particularly in the sale of grain. The actual method is that the buyer or his representative indicates the price he is ready to pay by twisting or clasping the fingers of the seller's agent, who is generally an *arhatia* of the seller, under cover of a cloth. One by one the buyers offer their rates. Usually one or two bids are allowed by each buyer and when all have given offers the name and offer of the highest bidder is publicly announced. This system offers ample opportunity of cheating the cultivator since he is unable to follow the course of bids nor he is taken into confidence until the final bid is declared.

(2) **Open Auction System.** Under this system, the broker invites bids for the produce and the highest bidder is sold the produce. It is preferred to any other system of sale as it ensures fair dealing to all parties and secures a premium for superior quality.

(3) **By Private Agreement.** Under this system, the individual buyers may come at any time convenient to them and make their individual offers. These may or may not be acceptable to the seller and the decision is conveyed by him by the close of the working day.

(4) **By Quoting on Samples.** Sale by quoting on samples is carried on at many places in India mostly in cotton, chillies, tobacco, etc. Under this system, the commodity is not heaped up but kept in bags on carts and the *arhatiya* collects from the sellers samples and takes them round and offers are made on the basis of these samples. After the price is settled and bargain struck, there is usually a wrangle over the quality on the cart and that of the sample. Allowances are claimed on that account and every effort is made by the buyer to go beyond the bargain.

(5) **Dara Sales.** Another common system is known as the *dara* sale in which heaps of grain of different qualities are sold at a flat rate. The advantage claimed by this system is that within a short time a large number of sales can be effected.

(6) **Close Tender System.** This system is generally found in regulated markets. When the produce is brought for sale to the market each individual produce is allowed a lot number. The packed goods are exhibited for sale in an arranged manner. Each buyer records the price he is prepared to pay against the lot number in the bid slip forms supplied by the committee. After recording the prices in the bid slips they are deposited in a sealed box. The buyer enters their name in priority list. The bid chits are taken out from the box at a specified time and are arranged in the serial order as per the priority list of them compared lot by lot and each lot is given to the highest bidder after getting consent of the seller.

(7) **Moghum Sale.** Under this system, the sale is based on the verbal understanding between buyers and sellers without

mentioning the rate as it is understood that the buyer will pay the prevailing rate. This method is followed when cultivators borrow from the traders or where his residence is far from the market.

System of Marketing

Majority of the produce of the cultivator is sold in the village itself at a much less favourable price than should obtain in the whole-sale market. It has been defined both subjectively and objectively. This sale generally takes place when the cultivator is in debt. Sometimes the *beoparies* also go from village to village collecting the produce from the farmers at comparatively reduced prices.

Though a major portion of the agricultural produce is disposed of at the village level through the hands of the creditors of the cultivators and other shrewd *baniyas*, some part of the produce, thus, finds a place in the market or mandis which are located at a distance varying from 5 to 20 (even more) miles from the villages. These markets may be organised or unorganised.

Now farmers in some villages have organised co-operative marketing societies. These societies which all sell the member cultivator's produce in bulk in large markets, where even international quotations are available, are able to secure better prices for the produce. The value of agricultural produce marketed by co-operatives during 1976-77 was Rs. 1189 crores as against Rs. 1524 crores in 1975-76, Rs. 1434 crores in 1974-75 ; Rs. 1100 crores in 1973-74, Rs. 921 crores during 1972-73, Rs. 844 crores in 1971-72 ; Rs. 600 crores in 1970-71 ; Rs. 588 crores in 1968-69 and Rs. 525 crores in 1967-68.¹

The Rural Credit Survey Committee Report observed that about 35% of the total production is sold by the cultivator, a large part of it (about 24% of the total) to traders and commission agents, 15% is disposed of in kind as wages or rent and nearly 8% utilised as seed. In the subsistence, in about one out of every three districts surveyed, less than 15% of the total produce was sold to professional traders and commission agents. In the cash crop areas, in one out of even eight districts, more than 45% was sold to professional traders and commission agents.²

Marketable Surplus

Marketable surplus is the total quantity of the commodity, available for sale, out of the current production after meeting the normal requirements of the producers for household consumption, necessary payment for wages, rent, share of produce, etc., in kind, seed and stock to cover the future exigencies including wastage.

1. Report of the Department of Civil Supplies and Cooperation for 1977-78, p. 140.

Marketable surplus will always be less than the actual production. But it can be higher or lower than the level of marketed surplus during a period depending on the extent of hoarding from the current production or dehoarding of the accumulated stock by the producers. This means the "theoretical surplus available for disposal with the producer, left after his genuine requirements of family consumption, payment of wages in kind, feed, seed and wastage have been met."¹ Objectively it is the arrivals, direct from the producing areas, out of the new crop.²

It is very difficult to calculate marketable surplus of agricultural crops because production year varies from crop to crop. Old crops cannot be easily demarcated from the new crop. There is always the fear of double counting, farmers and traders have always the tendency to under-estimate the quantity of the crop sold or stored. Therefore, in calculating marketable surplus usually subjective methods are employed, such as hectrage under cultivation, average yield per hectare in the area, average size of holdings, social conditions prevailing in the region with regard to payment of wages, economic conditions of farmers particularly with regard to indebtedness etc. Besides, the amount of crop to be marketed is also determined by the nature and size of crops, market facilities and the price at the time of sales. Thus, marketable surplus is not a free variant but a forced surplus.

The small holders are economically the weakest from the point of view of availability of marketable surplus and so is also the case with medium-sized holders. But substantial holders have enough marketable surplus. They provide as much as 60 per cent and over of their total produce of foodgrains for sale.

The National Planning Committee (1948) estimated that of the total wheat production 45 per cent is retained in the village and 55 per cent is the marketable surplus. For rice the respective figures are ; 59.5 and 40.5 ; for jowar 76.2 and 23.8 : for Bajra 73.5 and 26.5 ; for maize 75.5 and 24.5 ; for barley 74 and 26 ; for gram 55.7 and 4.3 ; for gur 20 and 80 ; for fish 75 and 92.5 ; for potatoes 27 and 73 ; for groundnut 16 and 84 ; for sesamum 44 and 56 ; for rape and mustard 14 and 86 ; for linseed 20 and 80 ; for castor seed 6 and 94 ; for cottonseed 5 and 95 ; for niger-seed 44 and 56 ; for cashewnuts 3 and 97 ; for tobacco 7.5 and 92.5 ; for sugarcane 82.6 and 17.4 and for milk 17 and 83.

1. P. C. Bansil, in *Indian Journal of Agricultural Economics*, Jan.-March, 1961, p. 26.
2. *Panel of Experts appointed on the recommendations of the Price Variation Enquiry Committee*, 1956.

**Estimated Market Arrivals of Rice, Wheat, Jowar and Gram
from villages into Assembling¹ markets**

State	Rice		(Wheat)		Jowar		Gram	
	1970-71	1974-75	1971-72	1974-75	1970-71	1974-75	1970-71	1974-75
	(as percentage of total production during the year)							
1	2	3	4	5	6	7	8	9
Andhra Pradesh	35.9	30.2	N. A.	N. A.	8.7	6.8	N. A.	N. A.
Assam	4.2	6.5	N. A.	N. A.	N. A.	N. A.	N. A.	N. A.
Bihar	24.8	20.2	11.6	16.5	N. A.	N. A.	51.7	49.0
Gujarat	33.5	51.8	36.6	31.2	21.2	25.2	N. A.	N. A.
Haryana	66.7	70.9	35.5	29.8	N. A.	N. A.	31.6	40.5
Karnataka	18.3	14.3	21.9	11.9	6.3	5.8	30.5	21.7
Kerala	10.9	8.2	N. A.	N. A.	N. A.	N. A.	N. A.	N. A.
M. P.	53.0	13.7	16.9	24.5	16.9	14.7	31.1	29.6
Maharashtra	14.1	6.2	4.31	32.6	N. A.	N. A.	50.1	31.4
Orissa	5.9	1.7	N. A.	N. A.	N. A.	N. A.	N. A.	N. A.
Punjab	93.0	89.3	60.0	46.3	N. A.	N. A.	20.7	24.7
Rajasthan	33.6	25.5	28.1	23.4	22.2	19.3	33.2	30.4
Tamil Nadu	39.5	39.3	N. A.	N. A.	12.8	16.9	N. A.	N. A.
U. P.	18.4	18.1	20.8	26.7	16.5	16.9	15.2	16.7
W. Bengal	17.3	15.2	N. A.	N. A.	N. A.	N. A.	N. A.	N. A.
Total of above	25.54	21.6	31.00	30.5	12.50	11.3	27.35	27.5
All India	25.54	21.6	31.00	30.5	12.50	11.3	27.35	27.5

Farming in India is largely subsistent farming. Nevertheless, a marketable surplus of over 25—30 million tonnes of foodgrains are carried every year from farms to the market. This is made up of an estimated percentage of marketable surplus for the whole country which is 31 in the case of rice, 45 for wheat, 25 for jowar and 50 for pulses. A major portion of this is transported by bullock carts. Railways carry about 10 million tonnes per year, 3 m. tonnes of rice and paddy, about 1-2 m. tonnes of jowar and other indigenous cereals about 2.3 m. tonnes of pulses and an unsteady volume of wheat.²

**Inter-State movement of Cereals by Rail and River
Quantities Moved (m. tonnes)³**

Commodity	1956-57	1960-61	1965-66	1969-70	1970-71	1971-72	1972-73	1973-74	1974-75	1975-76
Rice (not in husk)	1.64	2.23	1.69	2.22	2.52	2.52	2.34	2.28	2.07	2.59
Rice (in husk)	0.27	0.41	0.16	0.05	0.05	0.05	0.03	0.10	0.01	0.13
Wheat	0.83	3.06	4.60	4.81	5.15	5.43	6.32	5.19	5.12	6.90
Jowar	0.07	0.25	0.07	0.20	0.26	0.19	0.09	0.24	0.55	0.42
Bajra	0.85	0.17	0.06	0.26	0.36	0.49	0.18	0.27	0.30	0.28
Maize	0.13	0.24	0.19	0.65	0.47	0.49	0.52	0.32	0.58	0.42
Total	3.20	6.20	6.79	8.40	8.81	9.45	9.56	8.89	8.86	11.05

1. *Indian Agriculture in Brief*, 1974, p. 136 ; and for 1977, p. 162.

2. P. P. Lakshmann. "Movement of Foodgrains," *Yojna*, Vol. XII, No. 7 April 14, 1968, p. 14.

3. *Indian Agriculture in Brief*, 1974, p. 123 ; for 1977, p. 147.

So far as the foodgrains are concerned, the marketable surplus entering the market is rather low. This is because of : (i) the low productivity per hectare, (ii) the increasing propensity to hoard not only on the part of traders and middlemen but also on the part of growers as an insurance against contingencies. Hoarding has been due to their increased financial status and also because of increasing trends in food prices, (iii) rise in prices which induced the grower to grow less and less—just enough to meet his limited cash need, (iv) increased consumption by the agriculturists due to land reforms, (v) consumption of better varieties of cereals in place of inferior cereals. A great proportion of these cereals was previously left for the consumption in urban areas, (vi) there is no real marketable surplus among the vast majority of the cultivators, (vii) farm output responds very little to movement in prices. This lack of responsiveness is due to factors like orientation of production primarily to subsistence, availability of bulk of inputs within the producing units, wide prevalence of tenancies involving crop sharing, repayment of debts in kind and absence of efficient marketing organisation. These factors diminish the effectiveness of market mechanism in inducing the expansion of farm output and productivity. Hence, the low marketable surplus.

Marketable surplus in agriculture is the very foundation on which the whole structure of the country's development stands. "What is far more germane to the processes of development is the marketed surplus out of the increased production. If this marketed surplus does not increase *pari passu* with the increase in production, it may well contribute a fundamental limiting factor on the tempo of development by reducing supplies available for urban consumption, for industries and for export.¹

Marketable surplus may be increased by increasing actual production, by fixing of minimum and maximum prices of the produce to lessen incentive to hoard, by establishing more and more of regulated markets, increased monetization of the rural sector, and making use of co-operatives as the agency of mobilisation.

Marketing Agencies

As a substantial part of the produce is sold in the villages 65 per cent. According to the Rural Credit Survey Committee, 1961 a large number of middlemen has grown up between the producer and the ultimate consumer.

Village beopari is by far the most usual purchaser of the produce, who deals in his individual capacity. He usually collects the produce from the villages and *hats* and brings it to the wholesale markets and from there it reaches the consumers. Beoparies generally purchase when prices are low and sell it when they are high.

1. R. N. Poduval, "Economic Development and Marketed Surplus," *Agricultural Situation in India*, August, 1958.

Itinerant beopari wanders from village to village, collects the produce and takes it to the nearest market. He purchases at cheaper rates owing to the lack of competition from other beoparies.

Other agencies include *tolas* (or weighmen), who not only weigh the produce but also sometimes collect samples of the produce from the villagers and take it to the dealers in the towns. He gets his commission as well as *tolas*.

Local landlords and cultivators, especially the medium size-holders also sell the produce directly to the village *beoparies* or town dealers visiting the village markets.

Arhatias comprise of *kutchas* and *pucca arhatias*. The former is concerned with the assembling of produce while the latter distributes it. They also advance loans to the village merchants and traders on the condition that the produce will be sold to them or through them.

Broadly speaking, 70 per cent of the produce is handled by the producers themselves and the balance is handled by trade comprising commission agents, wholesalers, retailers, co-operatives and the government. The total gross values of products moving through these agencies was estimated at Rs. 6,100 crores in 1964-65, and 6 lakh families or 3 million people were employed in performing these operations.¹ The marketing system handles roughly 30 million tonnes of foodgrains and oilseeds.

Marketing Finance

Loans are taken by the cultivators for two purposes either for meeting the consumption need or for cultivation. These loans are taken in kind as well as in cash from the ex-landlord, big landlord, itinerant beoparies, village moneylenders, *arhatias* and *shroffs*. The usual rate of interest in case of seed-loan may vary from 25 to 50 per cent ; while in case of cash loans from 12 to 24 per cent. These agencies advance loans on the condition that the produce will be sold to them or through them. In such sales the producers do not get a fair price.

The village merchants, itinerant and petty traders generally depend upon their own resources, but in times of need, also borrow from the wholesale merchants, commission agents or country *arhatias*, at a rate varying from 9 to 12 per cent.

The wholesale merchant's firm either directly advance funds or they do it through the *kutchas* *arhatia*, who advances the money to the farmers on behalf of his principal and recovers the same on sale of the produce with interest. Co-operative and joint stock banks also make advances against the pledge of the goods deposited with

1 N. Y. Z. Faruqi, "Regulating The Markets," Commerce Annual Number 1967, p. 133.

them in their godown. Loans are advanced by these agencies upto 65 to 75 per cent of the value of the produce, at a rate varying from 4 to 8 per cent. The grain trade associations also advance loans to reliable dealers against the pledge of the produce.

Marketing Channels for Foodgrains

Foodgrains marketing channels, excepting that of rice, is fairly similar. In case of rice, rice millers play an important role. The usual channel for marketing of wheat, millets and pulses consists of the following:

(i) **Producer-consumer channel.** Wherein the consumers purchase directly from the producers in the village, so that the producer gets cent percent of the consumer's rupee.

(ii) **Producer-village-shopkeeper-wholesaler-retailer-consumer channel.** Producers sell part of their produce to village merchants in exchange for household requirements. They resell it in the village or at the nearby periodic or wholesale market.

(iii) **Producer-itinerant merchant-wholesaler-consumer channel.** The itinerant merchants purchase directly from the producer at the threshing floor in small lots, at a price which is close to the primary market price excluding transport cost. The producer is paid after the produce is sold.

(iv) **Producer-primary wholesaler-secondary-wholesaler-retailer-consumer channel.** It is the most widely used channel, wherein the commission agents (*katcha arhatias*) purchase from the producers in primary wholesale markets, and in turn sell (for the producers) to commission agents (*pucca arhatias*), who purchase on behalf of wholesalers who in turn sell to the retailers in towns and cities.

(v) **Producer-primary wholesaler-miller-rataile-consumer channel.** The foodgrains miller purchase their requirements through wholesale markets, and then mill the grain and distribute the flour through wholesalers or direct to retailers.

(vi) **Producer-primary wholesaler-Government procurement agency-roll flour mill-fair price shop-consumer channel.** In this channel, the Central and the State Governments purchase large quantities of foodgrains in primary wholesale markets and sell them through fair price shops in cities at fixed prices. Since 1974 rabi season, wheat is being purchased by the traders, 50% of which is to be delivered to the Government for sale through fair price shops and the rest to be sold by the traders in the market.

Marketing channel for Rice Paddy

The purchase and sale of rice and paddy is done under Government control viz., monopoly procurement, producer levy, miller (rice) levy and distribution at fixed prices. Paddy and rice can cross pro.

curement and distribution zone boundaries only under government permission.

The main channel in paddy-rice marketing is the rice mill, who buy paddy, mill it and sell the rice in the market. The marketing channel is somewhat like this :

(i) **Producer-commission agent-miller-wholesaler-retailer-consumer channel.** It is the most widely adopted channel. Commission agents work on behalf of the producers, get offers and sell rice to the millers. The payment by the miller may be made either at the time of sale or after its milling and sale. Millers sell rice to wholesalers either direct or through commission agents.

(ii) **Producer-itinerant merchant-miller-wholesaler-retailers-consumer channel.** In this, the merchant replaces the commission agent. who buys from the farmers and sell to the miller.

(iii) **Producer-miller-wholesaler-retail-consumer channel.** Here the miller directly purchases from the producer and through wholesalers-retailers pass it on to the consumers.

(iv) **Producer-miller-consumer channel.** Since most of the rice is milled by hand-pounding so the rice is purchased by the village shopkeepers who mill it and sell it in the village itself.

(v) **Producer-primary wholesale-retailer-consumer channel.** The producer sells rice in a primary wholesale market either direct to the miller or through a commission agent.

(vi) **Producer-government-miller-government-fair price shop-consumer channel.** As much as about 80 to 90 per cent of the paddy and rice is purchased by the government, have it milled and sell it through fair price shops.

Marketing produce

In all primary markets, the procedure for the sale of foodgrains is practically the same. It involves : (a) *delivery* of the produce—by bullock carts or trucks, through pack animals or headloads—in bags : (b) *grain* preparation and display, through *katcha arhatias* who undertake such activities as unloading, preparation of grain for sale, finding buyer, making actual sales, bagging and stitching of grain bags, weighing, collecting payments, etc., (c) *transaction*, the sales are made by the *pucca arhatias* at the price negotiated. The produce may be left with the farmer for some time or resell it in the nearby primary markets : (d) *payment* is done either on the same day or within a week or 10 days as settled between the *kutchra* and *pacca arhatias* : (e) *lifting* of the produce is the responsibility of the buyer, who may take it in bullock cart or truck for storage in his godown.

Market Conduct

Market conduct refers to the various methods which traders use against the competitors in attracting the customers. The village traders compete with each other for getting the producers produce, by offering both price and non-price inducements to the producers. Price may be offered, which is based on the prevailing price in the nearby-market, less the assembly transport, and probable profit. The non-price inducements include such methods as (i) giving of loans to the farmers upto 10 or 20 per cent of the expected value of the crop at a high rate ; (ii) banking services through which the arhatias arrange for loans on his next crop ; (iii) proving business advice regarding dealings in markets and informations about prices, etc., (iv) providing facilities of stay and lodging of the farmers and their cattle ; (v) supply bags and storage facilities for the produce, etc.

Marketing Facilities

The foodgrains markets are generally equipped with such facilities as market regulations and their enforcement, physical market facilities, market news, grading and inspection, and supervised weighing.

DEFECTS OF AGRICULTURAL MARKETING

We now discuss the main defects from which the marketing of agricultural produce suffers in India :—

1. Lack of Organisation. The first thing that strikes the observer is the lack of any kind of collective organisation among the producers. The buyers of agricultural produce specially in the case of money crops, usually operate on a large scale and are organised while the producers are invariably small ryots scattered over a wide area with no common organisation to guide them and to protect their interests, while purchasers of commercial crops on the other hand, are largescale operators on an organised basis. Under the circumstances, it is common to find that the producers of agricultural products as a class are being exploited by the purchasers.

2. Forced Sales The farmer, in general, sells his produce at an unfavourable place and at an unfavourable time and usually he gets very unfavourable terms ¹

Place, time and terms, these three factors, provide us with the clue for an understanding of the existing position. Because of poverty and indebtedness, unsatisfactory nature of communication, lack of staying power and the need for finance, the produce is sold soon after the harvest when there is a glut in the market and hence the price offered is very low. There is an all round depression in prices to the extent of 20% in the case of wheat and 25% in the case of linseed

1. National Planning Committee Report on *Rural Marketing and Finance* 1948, p. 42.

A cultivator, who has to borrow heavily for a growing crop, often mortgages it in advance so that the sale of produce, which is hardly more than a mere formality takes almost in his fields as soon as the crop is harvested. In all other cases where crop is not formally mortgaged it has to be disposed of almost immediately after harvest in order to pay off the debt to the Sahukar.¹

The nearest place where a farmer sells his produce is his own village. "It has, we think, been established that where the cultivator is in a position to dispose of his produce in a market, however limited its scope and badly organised its character be, he obtains a much better price for it even when he disposes of it in his own village."² The effective price realised by the cultivator is further reduced by malpractices which are as a rule more common in a village than in a market.

In pre-Independent India Mr. Hussain had estimated that 60 per cent of wheat, 35 per cent of cotton and 70 per cent of oil-seeds are sold in the villages or village markets in the Punjab. For U. P. the respective figures were 80 per cent wheat, 40 per cent cotton and 75 per cent oilseeds. In Bihar, Orissa and Bengal 5 per cent of oilseeds and 90 per cent of jute was sold in villages.³ In U. P. 30 per cent of the wheat grown was sold in the village, in Lyallpur the percentage was 52, while in Attock district (Punjab) it was as high as 98. As for paddy, 89 per cent was sold in the villages in Bihar, 72 per cent in Bengal and 89 per cent in Tamil Nadu. In the case of cotton, the village sales amounted to 79 per cent in Sind, 81.4 per cent in Khandesh, 51 per cent in Central Gujrat, 80.5 per cent in the Punjab. With regard to the sale of linseed, it was estimated that the all-India average of the percentage taken to the markets for sale by cultivators themselves was only 20 per cent as against 40 per cent sold by landlords and 35 per cent by *beoparis*.⁴

It may be noted that in the village, the produce is sold to the Sahukar, *bania*, landlord, prosperous tenants, *beoparis* and agents of wholesale merchants. The Rural Credit Survey Committee found that in nearly two-third of the sale transactions entered into with the traders the commodity is delivered in the village itself.⁵

Causes of Heavy Sales in the Villages

The following are the chief causes leading to heavy sales in the villages :—

1. National Planning Committee Report on *Rural Marketing and Finance*, 1948, p. 42.
2. *Report of the Royal Commission on Agriculture*, 1928, p. 383.
3. Hussain, *Marketing of Agricultural Produce in Northern India*, 1942, p. 96.
4. N. P. C. Report, *Op. Cit.*, p. 42.
5. *All-India Rural Credit Survey Committee Report*, 1951, p. 42.

(i) *The most important cause for the high percentage of produce sold in the village is, without doubt, the indebtedness of the producer.* Among cotton growers 71 per cent in North Gujarat, 82 per cent in Middle Gujarat, 78 per cent in East Khandesh, and 94 per cent in Sind had to borrow and percentage of loans taken from the *sahukar* amounted to 90 in Gujarat, 65 in Middle Gujarat, 53 in East Khandesh and 77 in Sind. A cultivator who had to borrow heavily for growing a crop often mortgages it in advance so that the sale of produce which is hardly more than a mere formality takes almost in his fields as soon as the crop is harvested. In other cases where the crop is not formally pledged it has to be disposed of almost immediately after harvest in order to pay off the debts of the *sahukars*. The proportion of produce in the markets diminishes as cultivators are debt-ridden or carry on subsistence farming in tiny holdings. In Attock district of the Punjab 98.6 per cent of the cultivators dispose of their surplus wheat to local *banias* who happen to be their *sahukar* also.¹

(ii) The second important factor which is responsible for the high percentage of village sales is *the unsatisfactory nature of communication with the nearest market.* With bad roads transport costs tend to become heavier. At times the producer has no cattle and carts of his own by which he can transport his produce to the market-place. In sugarcane growing areas the animals are either engaged in crushing cane just after the winter paddy harvest or in transporting cane to the mills, so that the supply of carts for the transport of other kinds of agricultural produce is very short. In irrigated tracts in the west of Uttar Pradesh, where cotton or fodder crops are sown just after the harvesting of the Rabi or spring crops, the grower has practically no time to go personally to the market.

(iii) *The element of time is an important factor* and this for double reason. The marketing possibilities of perishable commodities depend very largely on the rapidity with which they can be transported to the market-place. Communication is, therefore, of the utmost importance in this case. As regards non-perishable commodities the price to be realised by the cultivator depends, among other things, on the time when his produce is marketed. The majority of the Indian cultivators sell their produce within a very short period after the harvest with the result that the market is glutted and the prices go down considerably. According to the Marketing Adviser to the Government of India there is an all-round depression in prices to the extent of 20 per cent in the case of wheat and 25 per cent in the case on linseed.

(iv) *Most of the cultivators are hard-pressed for cash to meet the claims of their creditors and to pay off rent and other charges.* Even when they know fully well that by holding up the crop for a

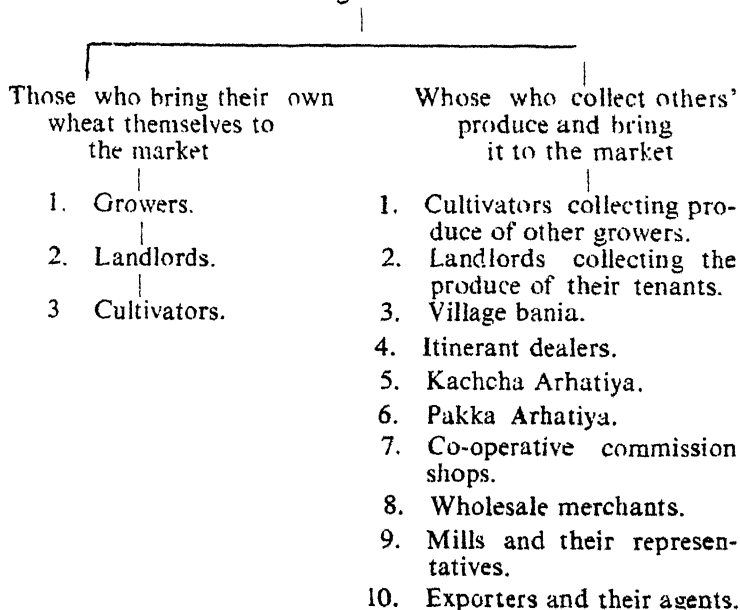
1. R. K. Mukerjee, *Economic Problems of Modern India*, 1939, Vol. I. p. 299.

few months, they would be able to secure a better net return, they have usually no other alternative but to market the produce immediately in order to meet their urgent liabilities. Cases are by no means rare where a cultivator in dire need for cash, sells his wheat or rice at the peak season when prices are very low but is compelled after six months or so to buy perhaps with borrowed money foodgrains for his own consumption and even seed for cultivation.

3. Superfluous Middlemen. Majority of farmers dispose of their produce in the village itself. The result is the intervention of most middlemen between the producer and the final consumers of his produce. The agencies in the chain of marketing from the producer to the manufacturer and consumer depend upon the nature of the crop. Paddy usually passes from village merchant to the mill or to the wholesale dealer in the assembling market and from the mill rice passes on to the wholesale dealer in the consuming market and then through one or more retailers to the consumers. Between the wholesalers or miller in the producing end and the wholesalers at the consuming end, a host of intermediaries intervene and execute orders on the strength of samples.

In the case of groundnut, the route taken comprises the grower, the village merchant, the broker, the decorticating merchant, the exporters' agent and finally the exporter. Similarly, in the marketing of wheat the agencies that help in the collection of wheat are:—

Marketing of wheat



While in the case of potato main channels of assembling are :

(i) wholesalers like village merchant or trader or representatives of commission agents who buy potatoes in small lots and arrange for their despatch to the consuming centres; (ii) wholesalers who are engaged in retail distribution of potatoes in the consuming markets.¹ The agencies engaged in the task of wholesale distribution of tobacco are : growers, professional curers, village merchants and money-lenders, commission agents and wholesalers, manufacturers, co-operative societies and exporters. According to Dr. Dantwala, "All those acquainted with the ready cotton trade know that in its transit from a farmer to a ship or a spinning mill not more than three or four transactions are made."² The cultivator of jute disposes of his produce to a *beopari* who received advance from *mahajan* or a broker on the understanding that he gets as much as he can for the latter. The mahajan in turn sells to big buyer, a baler, or another broker by whom preliminary sorting, grading and bulking is effected.³ Similarly, in rice the paddy is taken over from the cultivator on threshing floor either by the middlemen acting on behalf of the mills, by speculators or by local traders known as jungle brokers.⁴

It will, thus, be noted that there exist as many as 10 to 12 intermediaries comprising of the village *bania*, itinerant merchant or *beopari*, *dalal*, *kutchra* and *pucca arhatiya*, co-operative commission agents, wholesale merchants and the retailers. They function at various stages in the process of assembling and distribution of the produce. The existence of a long chain of middlemen reduces the share of the consumer's price received by the actual cultivator. According to the findings of the *Marketing Surveys*, the share of producer in a rupee paid by the consumer ranges from 52 paise in case of rice to 57 paise in case of wheat, in case of linseed it is 62 paise, in case of potato 50 paise and in case of groundnuts 45 paise.

The wholesalers' margin in the case of different commodities at different places varies to a considerable extent e. g., in rice it is 0.5 to 3.8 per cent ; wheat 0.8 to 1.0 per cent ; linseed 1.4 to 1.7 per cent and potato 10.4 per cent. Same is the position of the retailers. Retailer's margin varies from 3.7 to 6.4 per cent in the case of rice, 3.8 to 4.8 per cent in the case of wheat and 10.4 per cent in the case of potato. Dr. Munshi found that in marketing the produce the cultivator gets somewhere between 42.3 to 73.7 per cent of the consumer's price and from 26.3 to 57.7 per cent goes to the middlemen.⁵

1. S. L. Sharma, *Technique of Marketing in India*, 1952, pp. 103-104.

2. M. L. Dantwala, *Marketing of Raw Cotton*, p. 34.

3. C. W. E. Cotton, *Handbook of Commercial Information for India*, 1937, p. 146.

4. *Ibid.*, p. 186.

5. M. C. Munshi, *From Farmer to Consumer*, 1945, p. 34.

This may be seen from the table given below :¹

	Rice			Wheat			Linseed	Potato		
Items	Producer Cuttack Consumer Cuttack	Producer Tadepalligudem Tamil Nadu Consumer Madras.	Producer Bolepur (Bengal) Consumer Delhi	Producer Nalhati ; Consumer Suri (W. B.)	Producer Sagour ; Consumer Bombay.	Producer Hapur (U. P.) Consumer Delhi.	Producer Gonda (U. P.) Consumer Calcutta.	Producer Orai Consumer Bombay.	Producer Nilgiri Hills (Madras) Consumer	
	1	2	3	4	5	6	7	8	9	10
Producer's Share	77.8	63.2	57.8	73.6	63.1	83.2	73.7	67.7	55.8	
Freight	—	10.0	13.2	0.5	21.7	2.1	11.1	15.4	6.2	
Miscellaneous charges*	12.9	18.5	22.8	13.1	10.8	8.9	13.2	15.5	18.2	
Wholesaler's Margin	2.9	3.3	2.5	4.5	0.8	1.0	1.7	4.4	10.4	
Retailer's margin	6.4	5.0	3.7	4.5	3.8	4.8	—	—	10.0	
total	100.0	100.0	10.0	100.0	100.0	100.0	100.0	100.0	100.0	

However, the price-spreads are not very high when we take into account the fact that the producer's share in the consumers' dollar in U.S.A. comes to 68 per cent for poultry and eggs, 61 per cent for meat, 59 per cent for dairy products, 34 per cent for fats and oils and 52 per cent for fruits and vegetables. But the point that deserves notice in the case of India is that the high costs of Marketing are not due as in U. S. A. to hygienic processing, packing, storage and handling of commodities and superior servicing, but due to high freights, too many points of handling and multiplicity of middlemen.

1. The above data have been collected from the following reports published by the Agricultural Marketing Adviser to the Government of India.

- (1) Rice : *Report on the Marketing of Rice in India and Burma*, 1941, pp. 614-615. *Report on the Marketing of Rice in India*, 1955, p. 324.
- (2) Wheat : *Report on the Marketing of Wheat in India* 1937, pp. 438-39.
- (3) Linseed : *Report on the Marketing of Linseed in India*, 1938, pp. 328-29.
- (4) Potatoes : *Report on the Marketing of Potatoes in India*, 1941, p. 73.

*The charges include various charges such as handling, bagging, weighing local transportation, etc. Many of these services are arranged for the wholesalers and in all such services the wholesaler carries a margin of profit for himself.

In India, the incidence of freight varies from 2.1 to 21.7 per cent in the case of wheat ; 0.7 to 13.2 per cent in the case of rice ; 1.2 to 15.4 per cent in the case of linseed and about 6.2 per cent in the case of potato¹

4. Multiplicity of Market Charges. The marketing charges payable by the producers are numerous and varied in unregulated markets and they tend to reduce considerably the return to the producer from the sale of his produce. On a sale of produce worth Rs. 100, as much as 21.5 per cent of the income of the producer goes to meet the various expenses.

In the market the cultivator has to arrange with a *kacheha arhatiya* for the sale of his produce and in the larger markets he has to employ a broker or *dadal* to get into contact with the *kacheha arhatiya*. For their services he has to pay some commission. In addition to the *arhat* paid to the *arhatiya* and the *dadal*, a number of other charges have to be incurred. *Tulai* has to be paid for the weighing of the produce, *palledari* to cover the cost of the labourers who help in unloading the cart, preparing the produce, filling the scale-pans, holding the bag open where the produce is being measured, etc. the seller has also to submit to a deduction known as *garda* for impurities in the produce, and *dalta* for possible loss of weight and *dana* given to sweepers, watermen and even beggars. During the measurement and in almost all the markets deductions are made from the amount due to the seller for *dharma* or charity, dispensary, gaushalas, pathshalas

We give below three tables which will give an idea about the multiplicity of charges in the markets :—

According to the *U. P. Banking Enquiry Committee*, the total charges for produce worth Rs. 100 in the important markets of U.P. were : Hapur Rs. 2-9-0 ; Ghaziabad Rs. 4-3-0 , Hathras Rs. 4-13-0 ; Agra Rs. 5-1-9 , and in a country market in *Partapgarh* it was Rs. 2-13-0

Price Spread of Wheat (Prior to Independence)

	Sugaon Bombay	Hapur Delhi	Arifwala Delhi	Average
Cultivator's price	64 0	83.0	69 0	68.5
Assembling changes	3.0	1.5	3.0	4.4
Cost at source	4.0	4.5	3.2	4.4
Railway freight	22 0	2.5	17.0	17.0
Wholesaler's margin	1.0	3.5	2.0	1.9

1. *Report of the Marketing Sub-Committee of the Policy Committee on Agriculture, Forestry and Fisheries*, 1946, pp. 11-12.

Distribution charges destination	...	2.0	2.0	0.8
Expenses at Karachi	...	...	...	0.7
Steamer freight	3.0	...	...	1.2
Retailer's margin	3.0	3.0	4.0	3.3
Total	100.0	100.0	100.0	100.0

The following statement gives the costs incurred at the several stages of marketing of bananas grown in Raver Taluka (East Khandesh) and Bombay province and transported to Delhi during 1947-48 :

Description of items	Payments made Rs.	Percentage
1	2	3
1. Price paid to grower	1,600	21.51
2. Plucking charges	25	33
3. Cartage from orchard to local railway station	400	5.37
4. Incidental Expenses on tea and tobacco	25	.33
5. Unauthorised railway charges	150	1.98
6. Coolie charges for loading at local station	20	.26
7. Pattiwallas	200	2.68
8. Turnwala	1,600	21.51
9. Merchants who send wagon to Delhi	600	8.04
10. Railway freight	570	7.66
11. Coolie charges at Delhi	50	67
12. Cartage from Delhi station to Delhi fruit market	200	2.68
13. Commission to the agent at Delhi	250	3.3
14. Terminal Tax	75	.99
15. Postage	10	.33
16. Personal expenses of attendant on wagons	25	.33
17. Retailer's Margin	1,637	22.01

The above two tables relate to pre-independence period. Below are given the data for sale of rice in M. P., and the price paid by the consumer in 1959-60.¹

1. *Agricultural Situation in India*, January, 1962, pp. 1023-24.

Price Spread of Rice

	Bilaspur to Bhopal (coarse rice)		Drug to Indore (medium rice)		Rajpur to Nagpur (medium rice) pre-war %	
	Amount	%	Amount	%		
1. Producer's price	27,045	79.8	9,140	72.7		57.6
2. Net expenses up to the conversion of paddy into rice	66	0.2	391	3.1		5.4
3. Profit margin on hulling						7.9
4. Wholesale market- ing cost	1,934	5.6	525	4.1		7.6
5. Railway freight	1,458	4.2	712	5.7		7.9
6. Wholesaler's margin of profit	564	1.5	622	5.0		7.3
7. Retailing cost	137	0.4	42	0.3		...
8. Retailer's margin of profit	3,180	9.3	1,134	9.1	(a)	6.3
9. Price paid by consumer	34,325	100	12,566	100		100

It will be observed that the producer's share in the total amount paid by the consumers comes to about 73% in the case of sale at Indore and 74% in case of sale at Bhopal (the distance between Drug to Indore is 548 miles and that between Bilaspur to Bhopal is 462 miles). The profit margin of the retailers comes to about 9% in both cases and the total marketing cost including wholesaler's profit varies between 21 and 27%.

The items of cost in the marketing of fruits and vegetables after the produce is harvested and prepared for market which the grower has to bear, according to *Marketing of Fruits and Vegetables Committee*, Bombay (1934) were : (i) cost of packing (including cost of packages, twines and papers), (ii) cost of hauling from farm to the market, (iii) hamali, (iv) railway freight, (v) expenses in Bombay-hamali, rent charges for weighing balance, rent charges for using the sales ground *dalali* ; contribution to charity fund and postal charges by the commission agent for sending account sales. The grower receives 62 per cent of the price paid by the consumer for 100 oranges marketed through the co-operative sale society as against 53.8 per cent of the price when marketed through ordinary trade channels.¹

1. S. G. Patil, "Price Spreads in Marketing of Banaras from Raver Taluka to Delhi, in the *Journal of Agricultural Economics*, Vol. IV No. 1, pp. 37-38.

The objectionable feature about the market charges is that they are not only high but are also not clearly defined and specified. The charges vary from market to market and there is also no uniform practice as to the charges that are to be borne by the seller and those that are to be borne by the buyer. Even within the same market the *kachcha arhatiyas* may charge lower rates to the village *beoparis* who visit the market often and have regular trade connections than to the farmer who visits market only occasionally and has, therefore, only small volume of business to offer to the *arhatiya*. To make things worse many of the market charges are taken in kind and in taking their shares the persons connected are liable to be generous to themselves. As the *Report on the Marketing of Wheat in India* points out, "not only the *arhatiya* and *dalal*, but the *munim* (*arhatiya's* clerk), the *chaukidar*, the sweeper, the waterman, the *arhatiya's* cook and a horde of beggars of every description all regard themselves as entitled to a share of his produce."¹ He is fortunate if by the end of the day they have only taken two or three rupees, since they are just as likely in some markets to take seven...or eight rupees of his precious hundred.

5. Malpractices of Markets. In unregulated markets, malpractices tend to be common. These are :—

(1) Scales and weights are manipulated against the seller. This practice is rendered easier by the fact that till recently there had been no standardised weights and measures nor was there any provision for regular inspection.

(2) There are all kinds of arbitrary deductions for religious and charitable purposes and for other objects. The burden falls entirely on the seller and he has no effective means of protest against such practice.

(3) Large quantities are taken away from the produce of the cultivator as *bangi* or sample. According to the *Royal Commission on Agriculture* this amounted to as much as five to eight seers per cart of cotton in Khandesh. The cultivators are not paid for them even when no sale is effected.

(4) Bargains between the agent who acts for the seller and the one who negotiates on behalf of the buyers are made secretly under a cloth so that the seller remains ignorant of what actually takes place.

(5) The broker whom the cultivator employs is more likely to favour the purchaser with whom he comes into contact almost daily than the seller whom he only sees very occasionally. This tendency becomes all the more pronounced when, as it frequently happens, the same works for both parties.

(6) When disputes arise the cultivator has no means of safeguarding his interest. The enquiries made by the *Indian Central Cotton*

Committee showed that "greater use of the markets is not made by cultivator because of the disputes which arise after arbitrary deductions from the weight." Some of the practices obtaining in the market amount to nothing less than common theft.

That the poor agriculturists have to face great difficulties and expenses in marketing their produce can be easily brought out by the study of the following figures given by Mr. Mukerjee.¹

Place	Fruit	Percentage of sale proceeds received by producers	Percentage of sale proceeds received by middlemen
Poona	Guava	33.6	66.0
Poona	Orange	53.4	6.6
Nagpur	Mosambi	28.6	71.4
Nasic	Papaya	36.9	63.1

6. **Multiplicity of Weights and Measures.** Till recently, there had been an absurd multiplicity of weights and measures in India.²

The chaotic state of weights and measures in India has been more clearly brought out in all the reports published by the Central marketing staff. Weights made of sticks, stones and bits of old iron are even now a common feature in the markets and villages. A seer may range from 31 tolas to 102 tolas as in the Punjab, a *panseri* (which is five seers) may range from 5 to 9 seers and maunds may go up to 64 seers as in parts of Bihar and Orissa. Even in the tola normally the weight of one rupee is not always the same.³

1. B. B. Mukerjee, *Agricultural Marketing in India*, 1960, p. 12
2. "The Royal Commission on Agriculture found that in sixteen markets of the East Khandesh district of the Bombay State the maund had thirteen different values ranging from 2 1/2 seers at Bodwad to 80 seers at Pachora.—*Report*, p. 396.
 "The Indian Cotton Committee pointed out to the Commission that over the greater part of Bombay state cotton was bought and sold on the basis of a *khandi* of 784 lbs. of lint which was in consequence known as the Bombay Khandi. In the south of the State the unit was a bag of 336 lbs. In Khandesh the Khandi varied from 160 to 200 lbs. The Madras Khandi was only 500 lbs. of lint but in the tract in which 'western' cotton was grown the unit was the bag of 312 lbs. In Madhya Pradesh the measures 'Mini', 'Kino' and Khandi have each a different significance in different areas. In Assam, rice is measured by baskets of different sizes. At Kanpur there was a special cotton maund of 50 standard seers that is about 101 lbs. both for lint and kapas. In other parts of Uttar Pradesh the standard maund of 82 2/7 lbs was generally used for kapas, lint being sold in bales of 400 lbs. In Hamirpur the seer is 92 tolas while in Gaziabad it is of 112 tolas. In Bihar it ranges from 50 to 100 tolas, elsewhere it is of 80 tolas." *N.P.C. Report, Op. Cit.*
3. *Report on the Marketing of Wheat in India*, p. 94.

This multiplicity of weights and measures employed in India has deplorable effects in several ways. *Firstly*, it affords greater opportunities for cheating the ignorant cultivator and unscrupulous dealers readily avail themselves of such opportunities. *Secondly*, it gives rise to needless complications in practice as between one market and another which is by no means conducive to the interests of trade and commerce. *Thirdly*, for the collection of data on price movements the relative level of prices in different regions, the volume of agricultural production, etc. lack of standard weights and measures is bound to be a great handicap and seriously affects the accuracy of statistical calculation.

The multiplicity of weights and measures makes supervision difficult and affords greater opportunities for cheating the producers, creates an element of uncertainty in trade and renders fraud on the part of retailers as easy as it is profitable.

The report of the Marketing Sub-Committee has rightly observed that, "Deliberate malpractices, ignorance and carelessness have all combined to make the consumer in India pay an unnecessarily high price for many goods of different qualities."¹

7. Adulteration. Adulteration is often resorted to while marketing crops; and one of the most important reasons for such deliberate adulteration of agricultural produce is the high amount of refraction *khad* allowed in most markets and the non-mutual terms. In most of the wholesale markets in the producing areas a fixed deduction is made for impurities (say 5%) and the terms are non-mutual, i. e., a producer offering cleaner produce which has only 1% of impurities receives the same price as the producer offering produce containing 5% impurities. Naturally when this is the case the seller whether he be the middleman or the farmer takes care to see that the produce is adulterated to the maximum limit allowed in the market.

Adulteration of Commercial Crops

Various devices of adulteration are in vogue. Such as :—

Damping of cotton is done by the middleman on the contention that "the kapas comes in so very hot that if one puts one's hands into it, they would be blistered." In many places, damping is encouraged not only with a view to cause little harm to the pressing machine, but due to a mistaken notion that moderate damping makes it look glossy and increases the length of the staple. In other places unginned cotton is carried to markets on the back of buffaloes packed in strong bags and it is necessary to damp the cotton so that more can be pressed into the bags. The usual practice is not to water the cotton directly, but old gunny bags are put over it and water poured on bags. Sometimes hose pipes are also used to water the cotton directly. Recourse is also had to "false packing" by

1. *Report*, p. 77.

putting portions of one wet bale into the middle of a dry bale at the time of packing.

In the case of cotton, short staple is usually mixed with large staple. This admixture is done partly due to the cultivator growing and selling a mixture of different varieties of cotton by the seed mixed in the ginneries and partly because the cotton of the locality is a natural mixture.

In packing sann-hemp, small bundles of twisted, folded and tied fibres and tied heads which contain extraneous matter as "stick" leaf and dirt is usually resorted to.

The practice of adulterating wool with foreign matter is almost universal in the country starting in both the villages and the producers. Extraneous substance such as earth, dust, sand and even sheep and cattle dung are added to increase the weights not only by the primary producers but also by village and other merchants. Cases have been recorded when sand and dust were sprinkled on the wool before rolling and bundling it. Moistening of wool before sale is not an uncommon feature.

The practice of damping groundnuts is very common due to the belief that it makes decortication easy. Heaps of groundnuts are wetted in the factories by pouring buckets of water.

In linseed, the impurities may be non-oleginous like wheat, grain and oleginous like oilseeds, rape, custard etc.

Ambadi may be mixed with 'linseed oil' or 'jagni' with groundnut oil ; Papaya seeds or paraffin oil in black pepper, or an overdose of sodium hydrosulphite is given to gur or jaggery.

Adulteration in Food Crops

In wheat refraction may comprise of dirt or foreign matter including oilseeds, barley and other food and non-food grains : damaged and touched grains ; shrivelled or immature grains ; weevilled grains : and mixtures of red wheat in white. Barley and other grains are also mixed.

Rice is also adulterated with inferior rice imported from abroad, new rice is passed off as old rice and clay balls are often mixed with rice.

The survey undertaken by the National Consumer Service of the Bharat Sewak Samaj has revealed some very curious facts. The survey says that "Dhania and zeera sold in some of the country's markets contain dried grass while curry powder in several cases has been found to be heavily adulterated with horse dung.

"Tomato sauce is often only a mashed pumpkin with a small percentage of tomato. Vinegar in some cases has been found to be

acetic acid. Small chippings of white stone have been found in rice in some localities.

"Most of the common salt contains large quantities of white chalk, while turmeric is adulterated with lead chromate which has a deep yellow colour. In red chillies, many unscrupulous traders used lead oxide to brighten the colour and add weight."¹

The admixturing and adulteration in food and non-food crops has brought bad name to the country. Instances have been common when whole consignments were returned for wrong quality goods sent.

8. Inadequate Storage facilities. In most of the villages ryots store their produce in pits or receptacles variously known as *kudurus*, *kallis* or *thekas*. In the up-country markets produce is stored in *kothis* or *kuthalas* (earthen cylinders) and *khattis* (pits in the ground lined with mud and straw) and in a few centres in *pakka khattis* made of concrete. But that there is a general inadequacy of good storage facilities both in rural and urban areas can hardly be denied. The indigenous methods of storage adopted in the villages as well as in most of the upcountry markets do not adequately protect the produce from dampness, weevils and other vermins.

The losses due to inadequate storage have been estimated to range from 1.5 per cent (Foodgrains Investigation Committee) to 2 per cent to 2.5 per cent (The Prices Sub-Committee) to 5 per cent (as estimated by Dr. Baljeet Singh). A recent estimate puts the loss at from 5 to 15 per cent² by weight of the production and it is due to defective stage. This in turn is due to moisture absorption, excessive heat, insects, mites, rodents and birds. Even at 5 per cent the loss of cereals, millet, spices, oilseeds, jute, cotton, tobacco would come to over Rs. 4,000 million every year in India.

According to the Central Government the losses in foodgrains (red and western white wheat) stores in central warehouses at different places have been indicated below³ :—

Progress Loss (%)			
Place	Variety	At end of fifth month	At end of eleventh month
Kakinada	Red	5.1	10.2
	White	1.6	4.5
Mukameh	Red	11.3	17.8
	White	17.7	31.5

1. Quoted by *Blitz*, 25th July, 1964.

2. P. M. Thomas "Scientific Warehousing in Public Sector," Conference on Research and Industry, 20 and 21 Dec., 1965, New Delhi.

3. "Studies on the Large Scale Storage of Foodgrains in India," Pt. I, "Studies in the Storability of Wheat in Different Places by J. N. Sajid and Others in *Bulletin of Grain Technology*, Sept. 1965, Vol. II, No. 3, pp. 87-96.

Hapur	Red	8.5	14.6
	White	11.3	17.8
Hyderabad	Red	...	...
	White	3.0	...

Bulk Storages

Kakinada	Red	...	...
	White	0.9	5.2
Mukameh	Red	4.0	11.9
	White	2.5	6.5
Hapur	Red	4.1	11.2
	White	4.8	10.3
Manmad	Red	4.5	10.2
	White	1.1	...
Hyderabad	Red	...	...
	White	0.9	...

"At Hapur (U. P.) the percentage of wholly damaged grain separated from the pit-stored wheat between October and April varied from 1.2 and 1.5. At Muzaffarnagar in *kutch* pits opened in February and March the proportion of the damaged grain amounted to 1.7 per cent. On the other hand, in the new concrete this market, the wheat affected was less than 0.1 per cent. In the *pucca* brick lined pits of Chandausi, the actual loss was found to be in the neighbourhood of one per cent. At Shamli, the corresponding figures ranged from 0.5 to 1.7 per cent.¹

With the change of temperature, grains lose weight. When wheat is harvested, it contains some moisture which evaporates in summer and is regained during the monsoon month. Dampness raises the moisture content of the grain, thereby making it soft and therefore susceptible to insects. The damage is greater when the grain is stored in *kaccha* underground pits where the sub-soil water table ranges from 8 to 10 feet below the surface.

It is quite obvious that the foodgrain stocks held by co-operative societies, grain merchants and even by farmers are not kept in proper conditions. Therefore, the losses are substantially larger. In addition there are crops like jowar, pulses and maize which are infested by stored grain pests even before harvest. The insects form inside the kernel and are invisible until the threshed grains are put in storage. By the time the infection is detected, internal damage to grain becomes very great.

Losses due to rodents are also very great. The rats start damaging the grain right from the field to the time it is consumed. According to Dr. P. J. Deoras, there are approximately 2400 million rats in India. He has estimated that about 20 rats could consume

1. *Report on the Marketing of Wheat in India*. A.M.A. Series No. 1, p. 217.

the quantity of food sufficient for one person. On a gross estimate this would mean that rats are spoiling at least one fifth of the grain produced. Calculating on this basis of a tonne of grain being consumed by 100 rats per year the total consumption by the rat population of 2,400 millions would amount to about 24 m. tons. In terms of money this would come to about Rs. 18,000 million when calculated at the rate of Rs. 750 per tonne.¹

The nature of damage studied by Dr. Deoras is as follows :

(i) It has been noticed that apart from damaging crops and foodgrains in storage, rats carry foodgrains to their nests in burrows. As much as 15 kg. of grain have been recovered while digging out nests from about 30 rats burrows. (ii) The rats damage 10 times the quantity of food material they eat. They would excrete about 86 faecal pellets in 24 hours which would get mixed up with foodgrains. (iii) They void 1 1/2 gallons of urine during the year, and further contaminate grain by shedding thousands of hair from their bodies. (iv) In Bombay as many as 9,000 bags of foodgrains are auctioned as they are unfit for human consumption because they are damaged by rats in yards and godowns. (v) The small mice in the paddy fields have been found to climb up to the paddy plant and eat every grain while the big field rat usually cuts the whole plant.²

Besides rats "Insects, beetles and moths are prolific breeders and each couple lay anywhere between 100 to 400 eggs and their life-cycle is completed in 4 to 6 months. It has been estimated that weevilled grain in the case of wheat varies from 1 to 2 per cent or more, peas 1 to 5 per cent or more and arhar upto 2 per cent."

According to an estimate made by the Pesticides Association of India, on an average about 18 per cent of the production of crops is lost due to pest attack. In 1973-74, provisional estimate of gross national product value for agriculture was about Rs. 26,900 crores. Therefore, in terms of value the loss amounts to an alarming figure of about Rs. 5,000 crores, calculated at the existing price level. It is estimated that the maximum loss is caused due to weeds (33 per cent.), followed by plant diseases (26 per cent) and insects (20

1. Based on Central Food Technological Research Institute (CFTRI), Mysore's estimate.

"Another estimate puts the loss at nearly 10% of the total produce leading to the annual loss of Rs. 600 crores."—*Commerce Annual*, 1958, P. A. 84.

2. The method of assessing rat population has been :

- (i) Systematic trapping and counting the rats in an area and using this as a factor for multiplication in other areas.
- (ii) Counting the rat population at the rate of 70 pellets per rat per day.
- (iii) Using a tracking dust and estimating the consumption of plain bait material.

per cent), while the storage loss could be put at 6 to 8 per cent. Rats are estimated to cause about 6 per cent loss to the standing crops.

In 1973-74, nearly 12.5 million tonnes were subjected to avoidable loss due to pests and diseases, according to the Association. For rice and wheat alone, Rs. 1,900 crores were lost, while in groundnut the loss was estimated to be Rs. 350 crores, other oilseeds Rs. 90 crores, cotton Rs. 90 crores, sugarcane Rs. 284 crores, potato Rs. 30 crores, tea Rs. 77 crores, coffee Rs. 10 crores, and fruits (including in storage and transit) Rs. 200 crores.

9. Transportation Means not Well Developed

In India with her vast distances, the existing means of transport are woefully inadequate. "Communications from the field to the village and from village to the *mandi* are often extremely poor and defective. Bad roads, lanes and tracts connecting village with the markets not only add to the loss of transportation and aggravate the strain on bullocks and other pack animals, but also lead to the multiplication of small dealers and intermediaries. They also restrict market by hindering cheap and rapid movement of agricultural produce." In the construction of the railways in India administrative and strategic considerations seem to have had more weight than the provision of marketing facilities to the ryot by linking up the producing areas with markets by a good system of feeder lines. The freight policy followed by the railways also has given rise to considerable dissatisfaction. Railways in India do not afford the maximum possible facilities for the quick and safe transport of perishable products such as fruits, vegetable and dairy products. This naturally restricts the markets for such produces and reduces the incentive for intensive cultivation.

The road mileage position in India in relation to area or population is extremely unsatisfactory. There were only 52 miles of roads per 100 sq. miles of area as against 63 miles in Japan; 114 miles in U.S.A., 169 miles in Germany, 215 miles in U.K. and 430 miles in France per 100 sq. miles in 1974. Per 1 lakh of population these mileages are 85, 2,018, 314, 382 and 1630 respectively.

There is not only mileage deficiency but there is also a lack of feeder-roads connecting villages to market towns and the nearest railway stations so that produce cannot be advantageously transported to mandies. Most of the village roads are rather tracks which cut all connections with the mandis during rains.

Due to this lack of transport facilities much loss occurs. According to the Directorate of Storage Inspection, the loss of marketable surplus of food crops in transport is about 0.5 per cent of the quantities transported.²

1 R. K. Mukerjee, *Economic Problems of Modern India*, Vol. II, p. 295.

2 S. K. Bose, quoted in *Some Aspects of Indian Economic Development* 1962, p. 210.

According to the *Foodgrains Investigation Committee* the losses are $1/2$ to $3\frac{1}{2}$ per cent in mail transport ; $1/4$ to $1\frac{1}{4}$ per cent in road transport and $1/2$ to 1 per cent in river transport.¹

10. Absence of Grading and Standardisation of Agricultural Produce. Absence of grading and standardising agricultural produce is another defect. The reputation of Indian agricultural producers in the world's market is low. Even the *Export Promotion Committee* (1949) emphasised the poor quality of Indian exports. The Royal Commission on Agriculture investigated into the position of the Indian agricultural products in the world's markets and came to the conclusion that much of the produce was marketed in an unsatisfactory condition. In spite of the work of the Indian Central Committee, adulteration, mixing and damping, particularly the mixing of short with long staple cotton prevailed to an undesirable degree. Bad rating, bad grading and selection and excessive moisture were characteristics of much of the jute exported. The case of hemp was worse still. The position with regard to oilseeds other than groundnuts is a bit satisfactory.

There are no standard grades commonly accepted throughout India even for such important commodities as rice and wheat. In the absence of certain standard grades accepted by the whole trade as the basis for commercial transactions, attempt of individual producers merely secures the ordinary market rate. In fact the present practice of *dura sales* wherein heaps of both good and bad produce are sold together as one lot common in most markets, gives a premium to the inefficient producer as the good produce is made to carry along with it the poor stuff also. This practice of selling ungraded products of mixed quality has naturally reduced the reputation of Indian agricultural produce in the world markets. As pointed out by the Central Banking Enquiry Committee, the price paid by the consumers in Europe for these products is based very largely on reputation and this reacts unfavourably upon the price received by those cultivators who have improved their quality.²

11. Lack of Information Regarding Price. Absence of market intelligence as to prices is another defect. The villagers have practically no contact with the outside world nor are they in touch with the trend of market prices and they mostly depend on hearsay reports received from the village bania who is not at all interested in supplying them the correct information as to prices obtaining in the wholesale market. Even in cases where information as to prices in available prices are not comparable on account of (i) the lack of standard grades acceptable to the whole country ; (ii) variation in the amount of refractions allowed and the terms of standard contracts obtaining in different markets; (iii) inaccuracy of information supplied

1. *Report*, p. 112.

2. *Central Banking Enquiry Committee Report*, 1930.

by various agencies concerned ; (iv) variation in the price quotations given by local and Central Government ; (v) the considerable variations in weights and measures used in several markets in the absence of standardisation of weights and measures.

12. Lack of Financial Facilities at Cheaper Rates. The cultivator is financed by the village *sahukar-cum-trader* who is in his own turn financed by *arhatiya* and the indigenous banker. In the absence of warehouse and the lack of facilities for making advances against the warehouse receipts there cannot be any system of cheap finance against security of goods. There is at present no proper link between indigenous bankers or commercial bankers and the Reserve Bank of India. The various marketing agents borrow funds at a high rate of interest. This naturally leads to a rise in the cost of marketing with the ultimate result that the share of the price received by the producer is correspondingly reduced.

LINES OF IMPROVEMENT

If the agriculturist in India is to secure a higher price for his produce, if the needs and preferences of the consumer are to be conveyed to the producer with the minimum amount of delay and friction ; and if the large-scale industries are to secure steady and reliable supplies of raw materials of uniform quality, obviously the defects in the machinery for marketing of agricultural produce mentioned in the previous chapter should be remedied as quickly as possible. In fact, an improved system of agricultural marketing which will secure for the cultivator a larger proportion of consumer's price is a *sine qua non* for agricultural improvement in India.

Orderly marketing acts as an excellent incentive for increased agricultural production and its importance in the planned economy of the country needs no emphasis. In this connection the observation of the *Marketing Committee of U. N. O.* (1945) deserves note. It said. "It would be useless to increase the output of food, it would be equally futile to set up optimum standards of nutrition, unless means could be found to move food from the producer to the consumer at a price which represents a fair remuneration to the producer and is within the consumer's ability to pay. Similar considerations also apply to other agricultural products and to fish and forest products."¹ It is, therefore, necessary to remove the defects in the machinery for marketing of agricultural produce. An improved system of agricultural marketing, which will secure for the cultivator a larger proportion of consumer's price is a *sine qua non* for agricultural improvement in India.

The Royal Commission on Agriculture recommended and the Provincial and Central Banking Enquiry Committees endorsed the following measures for improving and organising agricultural marketing :

1. U. N. O. quoted in "*Agricultural Marketing in India*" in *Regulated Markets*, Vol. 1, p. 1.

- (1) Improvement of transport facilities including rural communications,
- (2) Lowering of railway freight rates and grant of other railway facilities,
- (3) Establishment of regulated markets under State legislation,
- (4) Standardisation of weights and measures,
- (5) Adoption of measures to secure improved quality of produce by organisation among buyers and traders to guard against adulteration,
- (6) Fixation of standards and grades of commodities.
- (7) Promotion of co-operative sales,
- (8) Holding of auction sales by agricultural departments to ensure increased prices to the cultivators who produce improved varieties,
- (9) Carrying out of market surveys, and
- (10) Appointment of expert marketing officers on the staff of the agriculture departments.

The defects of marketing may be removed in the following manner :

1. Establishment of Regulated Markets. Most of the defects and malpractices to the disadvantage of producer-seller can be removed by the exercise of proper control over markets and this could be done by the establishment of regulated markets in the country. Markets may be regulated either by local bodies or under State legislation.

The chief advantages of such markets are :¹ (i) Market charges are clearly defined and specified ; excessive charges are reduced and unwarranted ones are prohibited. The saving to the producer-seller has been estimated at Rs. 3 for every Rs. 100 worth of goods sold as compared to sale in an unregulated market ; (ii) market practices are regulated ; (iii) correct weighment is ensured by periodical inspection and verification of scales and weights ; (iv) suitable arrangements for the settlement of disputes regarding quality, weight and deductions, prevent litigation, safeguard the interest of the seller and smooth business ; (v) reliable and up-to-date market news are made available to the users of the market ; (vi) suitable quality standards and standard terms for buying and selling are conveniently enforced ; (vii) reliable statistics of arrivals, stocks, prices are maintained and (viii) facilities like sheds for the sale of produce, space for packing carts, water cisterns for cattle and,

1. Quoted in *Agricultural Marketing in India*—"Regulated Markets," Vol. I, p. 1.

storage accommodation for agricultural produce are provided : (ix) propaganda for agricultural improvement is more conveniently undertaken.

The Market Committees are responsible for enforcement of fair grading practices, licensing of market functionaries, deduction of unauthorised market charges, introduction of open auction systems of sales and enforcement of standard weights and to secure impartial arbitration in cases of disputes between the seller and the buyer. They also maintain market yards, provide facilities for parking carts, rest houses for farmers, canteens, godowns and sheds for auctioning the proceeds. The producer is given a sale slip showing details of the sale proceeds and deduction and payment is made on the same day.

The first attempt for regulation of markets was made in 1897 with the passage of the *Berar Cotton and Grains Market Act*.¹ Later on such Acts were passed in Central Provinces, Bombay, Madras, Punjab, Mysore, Hyderabad etc. so that at the beginning of the Second World War, there 122 regulated markets in the country. The number rose to 283 in 1960-61, to 450 in 1955-56, to 707 in 1961 to 1707 in 1967, to 2131 in 1970, 2936 in 1974 ; 3,016 in 1975, and 3,631 in 1976.

The following table gives the number of wholesale and regulated markets in India.

Wholesale and Regulated Markets, India as on 31.12.76

State	Total No. of Wholesale assembling markets	No. of markets brought Within the purview of Regulation		
		Principal market	Sub yards.	Total
I States Having Legislation				
Andhra Pradesh	396	396	—	396
Assam	108	4	—	4
Bihar	427	102	239	341
Gujarat	350	121	147	267
Haryana	136	81	55	267
H. P.	30	5	5	136
Karnataka	249	105	144	249
Kerala	72	4	—	4
M. P.	311	246	54	300
Maharashtra	571	222	205	427
Manipur	16	—	—	—
Orissa	100	36	22	58
Punjab	314	107	239	346

1. For a detailed study of Regulated Markets, readers are referred to author's *Principles and Practice of Marketing in India*, 1975 pp 734-745.

* Including sub-warehouses for the subsequent years

Rajasthan	217	100	91	191
Tamil Nadu	238	164	—	164
Tripura	33	1	—	1
U. P.	438	248	364	612
West Bengal	183	34	80	114

II Union Territories Having Legislation

Chandigarh	2	1	1	2
Delhi	12	3	3	6
Goa, Daman & Diu	11	1	2	3
Pandicherry	4	—	—	—

III States having no legislation

J & K	N. A.	—	—	—
Meghalaya	3	—	—	—
Nagaland	N. A.	—	—	—
Sikkim	N. A.	—	—	—

Union Territories Having no Legislation

Andaman & Nicobar Islands	4	—	—	—
Himachal Pradesh	23	—	—	—
Dadra & Nagar Haveli	N. A.	—	—	—
Lac, Mini, Aminidivi Is.	N. A.	—	—	—
Mizoram	N. A.	—	—	—
Grand Total	4,248	1,981	1,650	3631

As a result of the rationalisation of market charges alone, the producer-seller is benefited to the tune of 3 to 5 rupees for every 100 rupees worth of produce marketed by him in these markets. Besides, there has been the reduction in the market charges varying from 28 to 69 per cent in various markets. There has also been an increase in the number of sellers bringing their produce to these markets. Until 1944, less than 40 per cent of the produce was taken to the markets by the producers themselves. The average percentage has now gone to 70.

2. **Use of Standard Weights and Measures.** The use of standard weights and measures safeguards the interest of parties against cheating by false or under-weight. It is even now more urgently needed in rural areas in regard to transactions in which the farmer is concerned. The Planning Commission has recommended to adopt the metric system of weights and measures throughout the country because it is simple, easier to learn and remember; and its use would save time and labour in calculations. In 1958, the *Standards of Weights and Measures Act* was brought into force in certain industries and Government departments. For example, industries like cotton textile, jute, iron and steel, heavy chemical, engineering, cement, salt, paper, non-ferrous metals, rubber, copper, aluminium, lead, antimony, tin, coffee have all adopted it.

Metric commercial weights and measures conform to the specifications laid down by the Indian Standards Institution. Weights may be of cast iron, brass or sheet metal. Cast iron weights are hexagonal and brass weights round. Brass weights for weighing bullion are cylindrical with knobs to facilitate handling. Weights of the lowest denominations are of sheet metal. Capacity measures are made of metal sheets and may be cylindrical or conical,

Cast Iron Weights :

Kilogram	50, 20, 10, 2, 1
Gram	500, 200, 100

Brass Weights :

Kilogram	1
Gram	500, 200, 100, 50, 20, 10, 4, 2, 1

Brass Weights for bullion

Kilogram	20, 10, 5, 2, 1
Gram	500, 200, 100, 50, 20, 10, 4, 2, 1

Sheet Metal Weights :

Milligram	500, 200, 100, 50, 10, 5, 2, 1
-----------	--------------------------------

Capacity measures, cylindrical

Litre	2, 1
Millilitre	500, 200, 100, 50, 20, 20

Capacity measures, conical

Litre	20, 10, 5, 2, 1
Millilitre	500

Length measures

1 metre, divided into centimetres
0.5 metre divided into centimetres.

Length measures may be of metal or wood. The recognised weights are :

Weights

Milligram (millionth of a kilogram)
Gram (Thousandth of a kilogram)
Kilogram
Quintal (100 kilograms)
Metric ton (100 kilograms)

Length

Millimeter (thousandth of a metre)
Centimetre (hundredth of a metre)
Metre

Capacity

Kilometre (1000 metres)
Millimetre (thousandth of a litre)
Litre
Kilolitre (100 litres)

Thus the *gram* has replaced *tola*, the *kilogram* *seer* or *pound*, the *quintal* (100 kilograms) the *maund* or *cwt.*, the *metric tons*

the *long ton*, the *metre* the *yard*, the *kilometre* the *mile*, and the *litre* the *gallon*. Retail prices of foodgrains, sugar and other items of grocery are charged in kilograms.

The use of metric capacity measures became compulsory from April 1953, throughout the country.

3. Increased Provision of Storage and Warehousing facilities.

It has been well said that "the business of accumulating and storing perishable as well as non-perishable products in times of flush production, preserving them safely and then distributing them in times of scarcity is necessarily a part of production and equal in importance and dignity. By holding back a part of the surplus at harvest time the middlemen prevent a sharp fall in prices of commodities so that the producer's share in the benefit is increased and by letting out produce from the store in seasons when prices are normally likely to rise sharply, they check the rise and bring about some stability in market prices which benefits the consumer immensely." Storing is, therefore, a very important part of marketing. This point was realised by the Royal Commission on Agriculture and subsequently supported by the Central Banking Enquiry Committee.

Storing goods, before they are sold, is an important part of marketing. This point was fully realised by the Royal Commission on Agriculture and subsequently supported by the Central Banking Enquiry Committee and later on by the Agricultural Finance Sub-Committee, the Rural Banking Enquiry Committee and by the Rural Credit Survey Committee. All these bodies recommended that storage and warehousing facilities should be made available at all nuclear points of trade in agricultural produce.

The storage-capacity on the eve of the Fourth Plan was of the order of 10.93 million tonnes. Of this 2.88 m. tonnes was possessed by the Food Department and Food Corporation of India, 2.66 m. tonnes by the State Government, 0.96 m. tonnes by the Central Warehousing Corporation and 0.83 m. tonnes by S. W. C. and the rest by co-operatives.

The total storage capacity in 1976-77 was of the order of 40.58 lakh tonnes in the form of 23,661 rural and marketing godowns including the storage capacity owned by the F.C.I, the total storage capacity in the country was 140 lakh tonnes in 1976-77. The Fifth Plan target is to raise the storage capacity to 218 lakh tonnes by 1978-79. Besides, by 1976-77, there were 138 cooperative cold storages with a capacity of 2.36 lakh tonnes. Of these, 105 units with a capacity of 1.70 lakh tonnes have been installed.

As mentioned in the previous section, losses in storage are due partly to the change in temperature, dampness and partly to insects etc. These losses in temperature can be reduced by making provision for efficient ventilation in the godowns and by closing them during the monsoons and keeping them open during the dry season. Grains

in bags can also be protected by dunnage. It is necessary that sufficient space is kept between the bags while preparing a stack plan.

The damage caused by dampness can be reduced by making the floor or the godown damp-proof and the ceiling leak-proof. The pits should be of concrete and where this is not possible a proper layer of straw, ashes, neem leaves and sand can serve the purpose to a great extent.

Besides godowns should be white-washed annually so as to keep the insects away. The walls may be sprayed with 5% B. H. C. dust before keeping the bags. This will destroy the insects. "The fumigation operation with methyl bromide, ethylene debromide, ethylene dichloride and carbon tetrachloride can be useful in combating insect attack without harming the grain."

Experiments made have proved that for household purposes foodgrains can be stored safely with a small quantity of tin amalgam in empty kerosene tins or similar receptacles which can hold small quantities of grains, say 10 to 15 kilos and can be covered or closed on top. The chief merits of this method are : (i) that it is not at all necessary to make the grains insect free before storage, for, when adult insects from already infested material will emerge, pair and lay eggs, the eggs will never hatch and thus all further breeding of the pests will automatically cease : (ii) that tin amalgam is not difficult to prepare or handle and (iii) that amalgam can be used over and over again as there is no appreciable wastage of the material due to either evaporation or usage.

Losses to commercial stocks can be prevented through : (a) *durofume process*, under which gaseous chemicals are fumigated on the grain : and (b) *insect proofing of gunny bags* can prevent fresh infestation of insects.

4. Improvement in Transport Facilities. As an inseparable adjunct to proper marketing, adequate and appropriate transport facilities are indispensable. If the national economy is to be properly developed from all angles and if the interests of all sections of the community are to be safeguarded, the available transport facilities of every kind have to be very much improved and expanded.

The State governments should : (i) give the highest possible priority for the construction of all weather feeder roads in agricultural areas for facilitating the movement of agricultural produce to assembling markets or despatching stations and (ii) popularise and assist in the use of pneumatic tyres for bullock-carts and to assist in the manufacture and utilization of country carts, for transporting agricultural produce. The rail transport and steamship authorities should also (i) introduce a unified rates policy for different classes of goods for the whole country and (ii) provide adequate number of ventilated wagons and refrigerated transport for perishable products like fruits, vegetables, eggs, fish, milk and butter. Good metalled road

linking the village to market town will reduce the cost of transport and the strain on the cultivator's livestock and make it easier for the grower directly to market his produce in the town thus eliminating middlemen. The railways by charging low freights for the transport of perishable products such as fruits and vegetables and by providing faster services can make available to the producer an expanding market. As the *Committee on Co-operation in Madras* have pointed out. "Railway rates should be studied by the marketing staff from time to time with reference to trade conditions and movements of different kinds of produce and the need for regulating or reducing the freight rates should be periodically and forcefully impressed upon the railway authorities."

The *Rural Credit Survey Committee* strongly suggested an immediate examination of the rates which railways, state buses, etc. charge for the transport of the cultivator's produce to the consuming areas, with a view to considering what reductions may be given in the rates now charged. A similar review should be undertaken in regard to rates charged by the boat and steamer services.

The *Conference on Marketing and Co-operation* (1956) recommended that in order to ensure quick movement of agricultural commodities by rail or sea on behalf of co-operatives, the state governments should take steps to sponsor such movements and for that purpose authorise the Registrar of co-operative societies to issue the requisite certificates of eligibility for such priority. It also recommended that in view of the importance and increasing use of road transport for movement of agricultural commodities, the following facilities should be provided by the state governments :

(i) Public carrier licences should be given liberally to co-operative societies and particularly to marketing societies who want to have their own transport.

(ii) Loans may be given by Government to enable marketing societies to purchase motor vehicles for transport of agricultural produce. The state government may also arrange for purchase of these vehicles on rate contract basis.

(iii) Inter-zonal restrictions within the same state for movement of such motor transport vehicles should be removed, and there should be free movement within the same state.

The *Rural Credit Survey Committee* strongly suggested an immediate examination of the rates which railways, and State buses, etc. charge for the transport of the cultivator's produce and recommended that relief may be given in the rates now charged. The *Conference on Marketing and Co-operation* (1956) recommended that in order to ensure quick movement of agricultural commodities by rail or sea on behalf of the co-operatives, the State governments should take steps to sponsor such movements.

5. Provision of Marketing News. The Agricultural Commission had recommended that steps should be taken for a better dissemination of the marketing news. The marketing surveys conducted under the direction of the Central marketing staff have shown that "there is at present a surprising lack of co-ordination as between different markets. Prices do not move in harmony even in markets which are not far from each other. We often find a market glutted with a produce which is scarce in another, perhaps only a few miles off.

An efficient market news service can well be compared with the signalling system of railways as complete market information from various centres indicates green or red light : green from those markets where the demand exceeds supply and red from those where the supply exceeds demand. Goods from nearby areas are rushed to the centres, indicating green light and supplies to the market indicating red lights stopped. Supply and demand thus get quickly adjusted.

The objective of an efficient market news service should be to aid towards more intelligent production with the ultimate object of achieving effective distribution and fair pricing of farm produce both for the producers and the consumers.

6. Remunerative Prices for Farmers. It has been increasingly realised that mere increased production could be of little avail so long as the excess production failed to reflect itself in the shape of some extra income to the producer. How to ensure an economic and remunerative return to the producer ; how to establish a relationship between the price return and the quality of a produce ; how to provide a self propelling incentive for the maintenance of a standard which will bring the maximum return ; how to prepare the produce for the market, how to grade and differentiate—how to pack and transport ; what security and what facilities the producer should get in the market ; how to keep him informed of market trends and prices ; how to keep him abreast of consumer preferences—these have been some of the questions which demanded close attention of those concerned with the agricultural marketing.

Government and Agricultural Marketing

In India attention came to be focussed on the improvement of marketing only about 50 years ago with the publication of the Report of the Royal Commission on Agriculture. The Commission in their Report said : "The marketing of produce is such an important matter from a cultivator's point of view that we consider that an expert marketing officer should be appointed to the staff of the Agricultural Department in all major provinces." The Central Banking Enquiry Committee in 1931 endorsed the recommendations of the Royal Commission and went a step further by recommending the setting up of a Central

Agency for initiating and co-ordinating State activities relating to the development of marketing. As a result of these recommendations a Central Organisation, which was called the Office of the Agricultural Marketing Adviser to the Government of India was set up in 1934. On the recommendation of the Patel Committee, the work of the compilation of statistics and dissemination of marketing news, done by the marketing staff, was transferred to the Directorate of Economics and Statistics, Ministry of Agriculture, in order to avoid the duplication of work and to promote specialisation in certain aspects. The Directorate of Marketing and Inspection with its headquarters now situated at Faridabad, since 1974, undertakes the following functions.

(i) Promotion of grading and standardisation of agricultural, horticultural, dairy and livestock commodities ; (ii) statutory regulation of markets and market practices ; (iii) market research and surveys ; (iv) training of personnel ; (v) market extension ; and (vi) administration of the Cold Storage Order, 1964 and the Meat Food Products Order, 1973.

1. Market Research and Surveys

During the existence of this Directorate for over 44 years, marketing surveys of agricultural commodities have been carried out on an all-India basis and over 140 marketing survey reports and brochures relating to 40 important commodities have so far been published. The surveys covered all important aspects of marketing such as trends in production and utilization in India as well as world markets, net available supplies, market surpluses, prices, market practices in respect of assembling and distribution, transport, storage processing, commercial classification, financing, market functionaries, marketing costs and price spreads. In addition, Reports have been published on certain functions and institutions such as cold storage co-operative marketing, and regulated markets. A survey of marketable surplus and post-harvest losses of important foodgrains is under way.

2. Regulation & Control of Market Charges

To regulate and control market charges and to penalise the merchants who levy more than the prescribed charges, legislation has been enacted in all the states. To provide against unhealthy speculation, forward trading in agricultural commodities is being regulated under the Forward Contracts Regulation Act, 1952. The Forward Market Commission was created in 1953 for enforcing the provisions of the Act. The Forward Commission has established forward markets in raw cotton, jute, groundnut oil, coconut oil, black pepper and oilseeds. The policy being followed is that there should not be any monopoly in forward marketing of any single centre and that forward marketing should be brought as near to different regions as possible.

3. Standard Weights & Measures

To widen the market for agricultural produce and to avoid manipulations in prices to the disadvantage of the seller, and for easy comprehension of price quotations in various markets, Standard Weights Act, 1939 and the Metric Systems of Measures Act, 1958 were enacted, and their application made compulsory throughout the country.

4. Grading and Standardisation

To enable the produce of good quality to be exported and also for use in internal consumption, grades and standards of quality and appropriate trade marks have been developed under the Agricultural Produce (Grading and Marketing) Act, 1937. The agricultural products are graded under the trade mark AGMARK. To ensure that grading is done properly the inspecting staff is maintained under the Agricultural Marketing Adviser, who visits the grading stations, and inspects the graded products in the market. The staff also inspects the commodities graded for export to ensure that the produce conforms to prescribed specification. To ensure this, raw produce is screened to eliminate dirt, dust and other extraneous materials. Strict supervision is maintained during processing, packing and labelling. In respect of foodgrains, sann hemp, wool, bristles, the emphasis is on physical cleaning, while in case of ghee, butter, vegetable oils, the product is pooled together to obtain homogeneity, under the supervision of qualified chemists. There were in all 530 grading units in 1976-77 as against 572 in 1973-74, and 541 in 1972-73. The number of certificates of authorisation were 5059 in 1976-77 as against 4805 in 1973-74.

The commodities for export compulsorily graded (Under Sea Customs Act, 1962) are : unmanufactured tobacco, sann hemp, wool, bristles, goat hair, lemongrass oil, palmrosa oil, Sandalwood oil, vegetable oils, oils and oilseeds, myrabolans, walnuts, chillies, cardamom, spices, lac, turmeric, ginger, onions, garlic, tendu leaves, table potatoes, animal casting, pulses, resin and turpentine, etc. Commodities worth Rs. 259.76 crores in 1976-77 as against Rs. 174.74 crores in 1973-74 and Rs. 142.71 crores in 1972-73 were graded for export.

Grading in respect of commodities for internal consumption is being carried out on a voluntary basis for ghee, vegetable oil, butter, eggs, arecanut, cotton, wheat flour, rice, bura, gur, potatoes, fruits, honey, pulses, chillies, and whole ground spices like turmeric, coriander, curry powder and cumminseed and Kangra valley tea. The value of commodities so graded were worth Rs. 163.36 cr. in 1976-77 as against Rs. 248.37 cr. in 1973-74 and Rs. 186.0 cr. during 1972-73.

To provide adequate laboratory facilities for fixing grade standards, a Central Agmark Laboratory at Nagpur and 16 regional Agmark laboratories function at Guntur, Madras, Cochin, Kanpur, Rajkot, Calcutta, Bombay, Sahibabad, Jamnagar, Bangalore, Kozhi kode, Alleppey, Calicut, Tuticorin, Virudhnagar and Patna.

5. Market Intelligence

To collect and disseminate information regarding marketing services, regulatory measures, handling and storage of agricultural produce among producers, traders and consumers, the Market Extension Cell has been organised at Nagpur. Market Intelligence Service Scheme aims at: (i) effecting improvements in the collection, coverage and reliability of market intelligence, (ii) processing, analysing and interpreting marketing intelligence and using it in formulating and review of agricultural price policy, and (iii) effecting improvements in the market news service.

The scheme works on the following lines : (a) broadcast of a daily market news bulletin from the regional stations of A. I. R. in the rural programme ; (b) broadcast of a weekly market review from the regional stations of A. I. R. ; (c) distribution of a periodical market news bulletin to rural institutions ; (d) issue to local news papers unofficial handouts containing day's prices of important commodities in respect of important markets ; and (e) publicity of the rates through notice boards in the markets. Extension work among the producers and consumers is carried out through various media like documentaries, printed literature, exhibitions and cinema slides with the object of developing orderly marketing in the country.

The quarterly journal 'Agricultural Marketing' and monthly 'Marketing News' is published by the Directorate.

6. Training of Personnel

A number of courses for training of personnel in agricultural marketing are being conducted by the Directorate. Important of these are : (i) 11-month diploma course at Nagpur for the training of superior personnel of the State Marketing Departments ; (ii) four months' course at Sangli, Lucknow, Chandigarh and Hyderabad for the training of marketing secretaries and marketing superintendents required for regulated markets are conducted ; (iii) three months' course for training graders, grading supervisors and assessors at Chandigarh, Hubli, Lucknow and Madras ; (iv) six months' course in marketing of livestock and livestock products at Nagpur ; and (v) four months' training course in grading of cotton at Surat.

Under these courses respectively 438, 1889, 918, 24, and 309, persons were trained during 1974-75. The number was 506, 2443, 313, 43, 81, in 1976-77.

Storage and Warehousing

To provide warehousing facilities to the traders, the Agricultural Produce (Development and Warehousing Corporation) Act was passed in 1956. Under it, the Central Warehousing Corporation was established in 1957 at Delhi, and State Warehousing Corporations in each State.

The progress of Central and State Warehouse Corporations during the past decade has been phenomenal. This is evidenced by the fact that in 1960-61, there were only 40 Central warehouses with a storage capacity of 79,000 tonnes. At the end of 1969-70, as many as 123 Central warehouses were functioning in the country and their storage capacity was of the order of 12.73 lakh tonnes.

The number of State warehouses in 1969-70 was 616 (266 in 1960-61) with a capacity of 16.22 lakh tonnes (2.78 lakh tonnes in 1960-61).

Number and Capacity of Central and State Warehouses

Year	Central Warehouses Number	Central Warehouses Capacity (lakh, tonnes)	State (Number)	Warehouses Capacity (lakh tonnes).
1960-61	40	0.79	266	2.78
1966-67	100	7.49	607*	6.92
1967-68	101	8.45	629	7.38
1968-69	108	11.24	591	10.02
1969-70	123	12.73	616	16.22

*Including sub-warehouses for the subsequent year.

Statutory Regulations of Markets and Market Practices

Though regulation of markets is a State subject but the Directorate renders guidance and assistance to the marketing staff in framing marketing legislation and in its enforcement. All states except Assam, Meghalaya, Nagaland, Kerala and J & K have framed necessary legislation for market regulation. The number of regulated markets stood at 3631 during 1976-77.

The Directorate has been giving assistance for the development of infrastructure facilities in regulated markets since 1972-73. In 1972-73, 10 markets were given Rs. 1 lakh each, and during 1973-74, 11 more markets were given Rs. 13 lakhs in Bihar, M. P, Orissa, Rajasthan, West Bengal and U. P. Rs. 28.2 lakhs were sanctioned for 11 regulated markets in tribal, hill or drought-prone areas in 1976-77. During the Fifth Plan period, central assistance from Rs. 2 lakhs or Rs. 3 lakhs per market would be given in case of markets situated in the economically backward areas, markets located in tribal, hill or drought-prone areas.

Cold Storage Order, 1964, is enforced by the Directorate for developing scientific cold storage and minimise loss in storage. There were 1753 cold storage licences during 1977 as against 1624 in 1976 ; 1503 in 1973 and 1403 in 1972.

To ensure hygienic production of meat food products, the *Meat Food Products Order, 1973*, is being implemented.

Cooperative Processing and Cooperative Marketing

Processing is an activity connected with the preparation of food-grains and commercial crops for the purpose of making them fit for ultimate consumption. Almost all agricultural produce has to undergo one or more stages of processing before they are consumed. For example, sugarcane is processed into gur and sugar ; cotton has to be ginned and pressed for sending it to the mill ; paddy has to be milled before it could be consumed ; oilseeds have to be crushed for getting oil and pulses milled before they are put on the market. The work of processing is still largely done by the middlemen for want of adequate processing cooperatives.

Importance and Functions

Processing cooperatives are essential for the development of cooperative marketing, cooperative credit and consumers' cooperatives. Cooperative marketing of cash crops would be effective only if processing is also done by cooperatives. Well established processing cooperatives can effectively undertake to recover loans granted by the credit cooperatives for agricultural production. Processing cooperatives also affect the growth and functioning of consumers' cooperatives which can undertake marketing of finished products of these societies.

According to the **Third Five Year Plan**, "development of cooperative processing is essential not only for increasing rural incomes and facilitating credit for production, but also for building up a cooperative rural economy. Where cooperative processing units have been successfully established, they have proved invaluable as instruments of development in several allied fields".

Thus, processing cooperatives undertake : (a) the processing of food and commercial crops to make them fit for ultimate consumption ; (b) the recovery of production loans advanced by the agricultural credit societies ; (c) the distribution of agricultural requisites such as fertilizers, seeds, pesticides, and implements, and (d) the development of by-product industries.

Pattern of Organisation and Management

In some cases, the cooperatives engaged in marketing agricultural produce themselves take processing work. In others separate societies of agricultural producers are organised for processing. In large units such as cooperative sugar factories, independent processing societies are organised. In smaller units not needing substantial capital outlay, processing is undertaken by the cooperative marketing societies.

The membership of cooperative processing units consists of primary agricultural producers, workers' cooperative marketing societies, and central banks. Service cooperatives located in the area are also admitted as members to establish a link between cooperative credit and cooperative processing.

Business Practices

Different practices are followed by the cooperative processing units. In some cases, the processing societies undertake processing on behalf of the producer-members. In other cases, the societies pool produce, grade it, carry out processing and sell the produce and pay the members an average pooled price. The ideal business suited to a cooperative processing society, is to grade the produce, pool it, carry out processing and pay to the members the average pooled price.

Growth and Development of Processing Cooperatives

The beginning of processing cooperatives dates back to 1917, when a cooperative ginning unit was established in the then Mysore State. In Gujarat, a similar unit was set up in 1921. For nearly 40 years, cooperative processing of cotton was more or less confined to the areas of Mysore and Gujarat. The first sugar cooperative was set up in 1933 in U. P. Between 1933-35, 4 more sugar cooperative factories were opened; one in U. P. and three in Madras. For nearly two decades, no further development was made. In Maharashtra, the first sugar factory was set up in 1951 at Pravaranagar. Since then many new cooperatives have been set up.

During the *First Five Year Plan*, licences were granted to 16 cooperative sugar mills—13 in Maharashtra and 3 in Punjab. A few cooperative marketing societies also undertook processing as an adjunct to marketing. Such activities included paddy husking, groundnut decorticating and cotton ginning.

Processing cooperatives gained importance during the *Second Five Year Plan*. It envisaged the setting up of 166 processing cooperatives, including 48 cotton gins. In the light of the expanded programme on the recommendation of the National Development Council, 464 units were programmed and assisted during the Plan period. About 100 processing units (mainly in the field of cotton ginning) were also established. The Plan emphasised on the development of cooperative processing not only in relation to new units, but also

progressively by way of re-organisation on cooperative lines, of units which were privately owned. The *Third Five Year Plan* provided for setting up of 783 cooperative units (48 cotton ginning and pressing units, 36 rice mills, 29 Jute baling plants, 33 oil mills, 63 groundnut decorticators, 77 fruit canning units, 411 rice hullers) and 86 other units.

In 1965-66, there were 2,130 processing cooperatives (of which 78 were sugar factories, 155 ginning and processing societies, 329 paddy husking, 122 rice mills, 298 oil crushing, 22 fruit and vegetables and 1,106 others).

The *Fourth Five Year Plan* provided for the establishment of 550 processing co-operatives so that by 1969-74, there could be 2,000 such units. The organisation of new processing units was to be preceded by proper feasibility studies, advanced locational planning with reference to supply of raw materials, storage and marketing of finished product and over-all economics of each product.

During the *Fifth Five Year Plan*, about 650 new processing co-operatives were to be installed (76 sugar co-operatives, 45 cotton ginning and processing units, 2 jute mills, 40 oil mills, 4 solvent extraction plants, 4 vanaspati oil units, 155 rice mills, 35 dal-mills and 60 cold storages.)

Present Position

The number of processing units was 1311 in 1970-71, 1,775 in 1971-72, 1,856 in 1973-74 and 2,204 in 1976-77 the distribution of these is as follows :¹

Processing Co-operatives in 1971-72 and 1973-74

	1971-72	1973-74	1976-77		1971-72	1973-74	1976-77
Rice mills	790	738	737	Dal mills	40	51	67
Sugar factories	124	155	181	Cotton ginning & pressing	225	245	313
Spinning mills	23	26	84	Oil mills	173	—	207
Groundnut decorticators	58	58	58	Solvent Extraction plants	8	12	23
Jute baling units	44	62	156	Fruit & vegetable	36	35	37
Tea	15	16	16	Coffee	5	5	5
Copra oil mills	32	36	37	Cashew processing	4	5	6
				Cold storages	128	138	138

Sugar Processing Co-operatives. The number of co-operative sugar factories has increased from 52 in 1965-66 to 122 in 1976-77 and these factories had a capacity of 32 lakh tonnes. Of 122 factories, 119 were in production. They crushed 224 lakh tonnes of

1. *Report of the Department of Cooperation, Annual Report for 1972-73 ; and Report of the Dept of Civil Supplies & Cooperation for 1974-75*

sugarcane and produced 23 lakh tonnes of sugar, i. e. 48 percent of the country's total sugar production. These also utilise their by-products. The largest number is in Maharashtra (51), followed by U. P. (10) Andhra (11), Gujarat (10), Karnataka (9) and Tamilnadu (9) and the rest were in Haryana and Punjab (4 each), Rajasthan and M. P. (1 each) and Kerala (2). By the end of the Fifth Plan, their installed capacity would be of the order of 41 lakh tonnes.

The National Federation of Co-operative Sugar Factories (at Delhi) is the apex body of the sugar factories. It co-ordinates and facilitates the working of the 8 State Federations. It also assists in the promotion and organisation of new co-operative sugar factories. It also gives technical assistance to factories in getting the essentiality certificates, import licences for machinery and spare parts and controlled materials.

The factories are facing the problem of under-utilization of their installed capacities because of shortage of sugarcane ; increased use of sugarcane for the manufacture of *gur* and *khandsari* ; and inadequacy of early and later maturing varieties of sugarcane. According to Prof. 'Gadgil, "constant concern with electioneering has become a prominent and undesirable feature of sugar cooperatives."

Cotton Processing. Cotton processing co-operatives were developed mostly during 1955-56. In 1960-61, there were 128 ginning and processing societies, which ginned 4 lakh bales and pressed 4.5 lakh bales of cotton. In 1976-77, there were 313 such units out of which 226 were installed. They ginned 33 lakh quintals of raw cotton and pressed 9 lakh bales of cotton. Maharashtra has the largest units (127) followed by Gujarat (97), Karnataka (19), Tamilnadu (15), Andhra (6), Punjab (14) and Rajasthan (8) and Haryana and W. Bengal (1 each).

Co-operative Spinning Mills. The first such mill was formed in 1951 with the object of producing yarn needed for weavers co-operative Sector. The number of co-operative mills was 21 in 1961-62. This number increased to 26 in 1973-74 and 84 in 1976-77. Of these, 35 were cotton grower's co-operative spinning mills. They produced 508 lakh kgs. of yarn.

Co-operative Processing of Oil Seed. By 1976-77, there were 337 co-operative mills of which 254 were installed. There were 58 groundnut decorticators out of which 57 were installed. These mills crushed 5 lakh quintals of oil seeds.

Besides there were 23 solvent extraction plants, 8 cotton seed crushing plants and 8 vanaspati plants.

One of the main problems of these processing units is the wide fluctuation in their prices so that there has been a considerable under-utilization of installed capacity.

Co-operative Processing of Plantation Crops : By 1973-74, there were 70 processing units for plantation crops 37 coconut oil mills, 16 tea factories, 5 coffee securing plants, 6 cashewnut processing units, 4 rubber processing units and 2 cardamom oil extraction plants. These are mainly in the states of Kerala, Karnataka, Andhra Pradesh and Orissa. The value of plantation crops marketed by co-operatives went up from Rs. 34 crores in 1974-75 to Rs. 43 crores in 1975-76.

Co-operative Processing of Fruits and Vegetables. There were 34 fruits and vegetables processing units in 1976-77 of which 27 units were installed. They processed about 1500 tonnes of fruits and about 600 tonnes vegetables. The value of exports of fruit products by the co-operatives amounted to Rs. 33 lakhs during 1976-77. The main difficulty in the development of these units is the lack of assured market for the finished product. Moreover, these have to compete with the established firms like Kishan, Mohan Meakin and Hindustan Levers.

Processing Cooperatives for Paddy. By 1976-77 there were 737 cooperative rice mills, which included 6 pilot modern rice mills. Of these, 711 units were installed. Andhra had the largest number (145) followed by Maharashtra (127). M.P. (95), Karnataka (76), Orissa (71), Tamil Nadu (28), W. Bengal (30), U. P. (19) and the rest were in Assam, Gujarat and Punjab. Some of these units were provided with financial assistance for modernisation.

These units have been facing various difficulties like that of getting licences and delay in getting milling equipment, lack of technical guidance, working capital and want of a trained managerial personnel.

Difficulties and Problems of Processing Cooperatives

The processing units in the co-operative sector have been suffering from various problems viz .

(i) Most of the units (particularly rice mills, cotton ginning etc.) are unable to work to their fullest installed capacity because of inadequate supply of raw materials.

(ii) Wide fluctuations in the prices have discouraged these units (particularly oil mills) to utilize fully their installed capacity;

(iii) The members of these co-operatives are marginal and small farmers. Therefore, adequate finance is not available.

(iv) Inadequate attention has been paid to internal management and efficiency. There has also been lack of suitable trained managerial personnel.

(v) Planning of many units has not been carried on scientifically.

(vi) Some of the units are dominated by traders : as much as 60 to 70% of paddy processing units belonged to traders in Vidarbha.

Besides these, certain other defects are also visible such as : defective pricing policies, party politics in elections, lack of cost consciousness, and delay in getting loans from financial institutions.

Suggestions for Improvement

1. Proper Planning. Before setting a new processing unit in the cooperative sector, a proper and detailed investigation regarding their economic feasibility must be undertaken.

2. Pattern of organisation. Processing units not involving high capital outlay should normally be set up as an adjunct to marketing cooperatives and large-sized processing units should be organised as independent processing units of the growers' spinning mills.

3. Supply of raw material and storage facilities. Arrangements should be made for getting regular supply of required raw material and proper storage of the same be provided on a scale much larger than of private units.

4. Technical know-how. For providing special technical knowledge in the areas of location of site, selection of plants and machinery etc. the services of qualified engineers and processing marketing experts should be made available.

5. State assistance. The State and Central Governments must provide for finances of the units and also provide guarantees to the financing agencies for giving them loans.

COOPERATIVE MARKETING

Co-operative marketing is the system by which a group of farmers join together to carry on some or all the processes involved in bringing goods from the producer to the consumer. According to the Reserve Bank of India, "A marketing society is a co-operative association of cultivators formed primarily for the purpose of helping the members to market their produce more profitably than is possible through private trade."

Objectives

Cooperative marketing of agricultural produce is necessary not only for stabilising marketing conditions by means of orderly and regulated supply of commodities but also for improving bargaining power. According to an F. A. O. publication. "The aim of every marketing cooperative society is :

(1) to sell the members' product directly in the best market and in a state which attract the best price.

(2) To help the members to produce the best products and those that are most in demand.

- (3) To give fair weight.
- (4) To grade the produce in such a way that best price is obtained for all qualities, to the advantage of the grower.
- (5) To handle the crop cleanly without damage or waste in a way that will increase, not decrease, its-value.
- (6) To provide for fair trading practice and to use its influence against rings and manipulations of prices.
- (7) By advances on fair terms, to help the member to finance himself while he is waiting for his crop to ripen.
- (8) To give a farmer a better understanding of all stages in marketing process."¹

Cooperative Marketing Structure

In most of the states, there is a two tier structure of cooperative marketing with primary marketing societies at the level of secondary marketing and apex marketing federation at the state level. However, in some states like Andhra Pradesh, Gujarat, Haryana, Himachal Pradesh, Maharashtra, Punjab and U.P., there is also an intermediate tier at the district level mainly as a legacy of the past.

Primary Marketing Societies. Cooperative marketing has a pyramidal structure. At the base there are the primary marketing societies consisting of agricultural purchase and sale and production and sale societies and the primary non-agricultural purchase and sale and production and sale societies. Their area of operation may roughly correspond to a *taluka*. They buy and sell agricultural commodities and various other goods for the benefit of their members.

Such societies may either deal in a single commodity or in many commodities together. The most important single purpose cooperative marketing societies in U.P. and Bihar are those dealing with sugarcane. In other states they deal in more than one commodity. For example, in Gujarat these deal with cotton and fruits, in Karnataka with spices; coffee, paddy, oilseeds, tamarind, jaggery, chillies and cotton. In Punjab these deal with wheat, oilseeds, gur, cotton, paddy, Jute and gram. In West Bengal paddy, Jute, cardamom and coconut are dealt with. In Kerala these deal with honey, orange and cardamom; in Jammu and Kashmir with ghee, pulses, fruits and walnuts. In Tamil Nadu these deal with groundnuts, paddy, cotton and potatoes. In Maharashtra, these deal in chillies, oilseeds, jowar, cotton, fruits, tobacco and vegetables.

These societies collect, grade, standardise and make arrangements for the sale of produce of their members and also advance loans to the members against goods produced. The multipurpose societies are now becoming popular. They also do the work of

1. F. A. O., *Cooperative Marketing for Agricultural Produce*, 1957, p. 12.

buying and selling agricultural and other produce in addition to the provision of short-term finance and supply of agricultural and domestic requisites of their members.

Central Marketing Societies. Above these primary societies there are the District Central Marketing societies which generally operate over a part or an entire district. They do the work of buying and selling and extend credit and other help to the primary societies. These societies generally purchase and sell food-grains, jaggery, cotton and oilseeds in Gujarat and Maharashtra. They distribute chemical fertilizers and oil cakes to the agriculturists through primary marketing societies in Tamil Nadu. Their membership consists of individuals and cooperative societies. These societies became very active during the Second War period but with the withdrawal of controls, however, their work has been reduced.

State Marketing Societies. At the top of these are the State Marketing Societies of Federations which are intended to serve as apex institutions for all cooperative marketing societies operating in a state. They do the work of buying and selling and give credit and other facilities to the central societies and to primary societies. These societies are mainly engaged in wholesale or monopoly distribution of chemical fertilizers, controlled commodities (like iron, steel and cement), consumer goods (like sugar, wheat, Kerosene, coffee seeds, rice, milk powder) and agricultural implements and insecticides. They coordinate the work of cooperative marketing. Their membership consists of the individuals and the societies. Such societies have been established in a few states and their work is limited in scope and is not commensurate with the needs of cooperative Marketing in India.

At the All India level is National Agricultural Cooperative Marketing Federation (NAFED) (set up during 1958-59). Its main objective is to coordinate and promote the marketing and trading activities of its members in agricultural and other commodities. Its other objects are to : (i) make arrangements for the supply of agricultural requirements to its members : (ii) to take up procurement of wheat, pulses required for public distribution system in deficit areas in collaboration with S. F. C. and (iii) to promote inter-state and international trade in agricultural and other commodities. Its area of operation extends to all the states.

On 30th June 1975, there were 3127 primary marketing societies covering nearly all the important secondary markets in the country. Of these 2370 were state partnered.

Besides, there were 25 state level cooperative marketing federations, including those in Mizoram, Arunachal Pradesh, and Lakshadweep ; and 170 district regional marketing societies excluding 506 sugarcane supply societies (cane unions) in U. P. (134) and Bihar (72). In addition, there were at the state level, 7 commodity

cooperative marketing federations, viz., 2 for fruits and vegetables in Delhi and Gujarat, 1 for cotton in Gujarat, 1 for sugar cane supply in U. P. and 3 other specialised commodities.

Tribal cooperative development corporation federations have also been established in M. P., Andhra Pradesh, Orissa, Bihar, Rajasthan, Maharashtra and West Bengal. The tribal cooperatives at the primary level are affiliated to these federations.

The cooperative marketing structure is thus complete. No new societies are being organised except in tribal areas which were either uncovered earlier or where re-organisation of societies has been taken up on the recommendation of Bawa Committee. New societies are being organised in area where new secondary markets are coming up which cannot be covered by the existing societies for handling certain specialised commodities like fruits, and vegetables, plantation, crops etc. The main emphasis has been, during the Fifth Five Year Plan, on the consolidation and strengthening of the existing structure and on developing cooperative marketing in the cooperatively under regional unbalances. Accordingly, the cooperative marketing, processing, storage and supplies in cooperatively under-developed state (comprising Assam, Bihar, Orissa, Rajasthan, W. Bengal, Manipur, Jammu & Kashmir, Meghalaya, and many Union Territories) are being set up. For this purpose, the Government of India funds are channelised through the Corporation to assist the state governments for strengthening the share capital base of selected cooperative marketing societies in these areas so as to enable them to improve and expand their business activities in marketing of agricultural minor forest produce, distribution of agricultural inputs and supply of consumer articles in rural areas. The Corporation sanctioned a sum of Rs 56 lakhs to 163 Cooperative marketing societies, towards the share capital assistance upto 1976-77.

The Cooperatives handled agricultural produce to the value of Rs. 1190 crores in 1976-77 as against Rs. 1564 crores in 1975-76. This decline in the value was due to the fact that during rabi harvest of 1977, the government removed the zonal restrictions on the movement of wheat and other foodgrains. As a result, the cooperatives share in procurement of wheat in U. P., Gujarat and Maharashtra declined further, the Commodity Corporation did not mostly utilise the services of cooperatives in the procurement operations such as cotton. Likewise, the share cooperatives in the marketing of sugar-cane declined mainly due to the diversion of cane to khandsari as also on account of drought conditions in certain areas.

Functions and Progress of Marketing Cooperatives

The cooperative marketing societies play an important role in the following spheres :

1. **Marketing of Produce.** They arrange for the sale of members' produce to the best possible advantage by enabling them to

obtain better prices because of sale in bulk and consequent economy in the cost of marketing.

In 1965-66, these societies sold goods worth Rs. 209 crores. The value of goods sold increased to Rs. 650 crores in 1970-71, to Rs. 921 crores in 1972-73, to Rs. 1100 crores in 1973-74 and Rs. 1189 crores in 1976-77. The value of agricultural produce sold by co-operatives has been substantial in Maharashtra, U. P., Gujarat and Punjab and these accounted for about 74 per cent of the total value of agricultural produce marketed by co-operatives.

The co-operatives handled food grains to the value of Rs. 137 crores in 1965-66; Rs. 261 crores in 1970-71, Rs. 321 crores in 1973-74, Rs. 422 crores in 1976-77 as against. Marketing of food-grains is done by the co-operatives in Maharashtra (jowar and rice) Punjab and U. P. (wheat and bajra) Andhra Pradesh and Orissa (paddy).

Under commercial crops, the co-operatives sold sugarcane worth Rs. 411 crores in 1976-77. Rs. 324 crores in 1972-73. Rs. 147 crores in 1965-66. The value of cotton marketed by co-operatives was of the order of Rs. 243 crores and Rs. 25 crores respectively during this period. Other important commercial crops marketed by co-operatives are oilseeds, fruits and vegetables and plantation crops of the value of Rs. 356 crores in 1976-77.

Progress of Marketing of Agricultural Produce by Cooperatives (in Rs. Lakhs)

Year	Foodgrains	Sugarcane	Others	Total
1968-69	22,167	22,685	13,994	58,846
1969-70	20,144	25,986	13,844	59,974
1970-71	26,058	22,440	16,373	64,871
1971-72	42,853	24,786	16,729	84,368
1972-73	32,092	32,426	27,614	92,132
1973-74	35,535	44,016	31,410	110,961
1974-75	44,671	47,079	51,607	143,357
1975-76	52,235	42,140	62,052	156,427
1976-77	41,092	42,213	35,609	118,914

2. Distribution of Fertilizers. Marketing societies also distribute fertilizers. Co-operatives are the sole distributing agencies for the distribution of fertilizers in Assam, Andhra, Bihar, M. P., U. P., Punjab, Kashmir, Karnataka, Orissa and Tamil Nadu. They distributed fertilizers to the value of Rs. 78.63 crores through 45,000 retail depots in 1965-66. This increased to Rs. 400 crores and 42,316 depots in 1973-74. The sale of fertilizers amounted to Rs. 617 crores in 1974-75, Rs 716 crores in 1975-76, Rs 730 crores in 1976-77 and Rs. 650 crores in 1977-78.

3. Distribution of Seeds and Agricultural Machinery. The co-operatives distributed seeds worth Rs. 45.11 crores in 1972-73

in U. P., Gujarat, Bihar and Maharashtra. In 1976-77, these were sold to the value of Rs. 51.39 crores. Agricultural machinery to the value of Rs. 13.29 crores was distributed in Maharashtra, Gujarat, M. P., U. P., and Karnataka in 1972-73. In 1976-77, the value amounted to 29.36 crores. Pesticides insecticides were sold to the value of Rs. 12.12 crores in 1972-73. These amounted to Rs 24.71 crores in 1976-77 the value of consumer goods distributed was about Rs. 250 crores.

4. Grading and Pooling of Produce. The cooperatives undertake activities in connection with grading, pooling and procuring of produce of members. Unfortunately very few marketing societies have undertaken this activity, and even those who undertook it, did it on a limited scale. It is confined to a few products only cotton, jute, turmeric, potatoes, etc. For example in Orissa, the Jute marketing Society pools and bales jute, while Tikkabali Society undertakes grading and pooling of turmeric. In Andhra Pradesh grading is done only by Anakapalli Marketing Society in Vishakhapatnam District and the Hindupur Co-operative Society in the Anantpur District. In Tamil Nadu very few societies pool coffee but no grading is done. In Maharashtra, grading is restricted to fruits and eggs and that too a few societies. In Bihar, vegetables are pooled and graded by the Vegetable Grower's Societies. In U. P., grading is done for ghee. In M. P. a few societies pool and sell cotton by auction on commission basis. No grading is done by the co-operative societies. In West Bengal, the societies engage in the outright purchase of crops and grading is done only on a limited scale. In Himachal Pradesh potatoes are graded, while in Kerala paddy, oranges, honey and cardamom are pooled and graded.

5. Processing Activity. Some co-operative societies have also taken to processing activities. For example, in Andhra Pradesh, paddy is converted into rice and groundnuts are decorticated. In Tamil Nadu, groundnut is decorticated, cotton ginned, paddy husked and arecanuts and coffee cured. In Maharashtra, processing confined only to cotton ginning and pressing. In Punjab cotton ginning, pressing and processing of chillies is done. In Orissa, processing activities comprise oil pressing, hand pounding of rice, bidi-making, in Kerala paddy husking and in Karnataka cotton ginning is done.

6. Provision of Storage Facilities. The co-operatives also provide storage facilities to their members by renting or owning godowns and there by facilitate grant of advances against pledge of produce, and sale of members' produce. Till the end of 1973-74 there were 19,000 (4,056 mandi level and 14,944 rural) godowns. The total storage capacity in the co-operative sector was about 3.3 million tonnes.

During 1976-77, there were 23,661 godowns with a total capacity of 4.0 m. tonnes.

Position of godowns in India

	1974-75	1975-76	1976-77
Rural (No.)	15,893	17,495	18,865
Mandi (No.)	4,369	4,663	4,796
Total (No.)	20,262	22,158	23,661
Total Capacity (in Tonnes)	3,550,000	3,855,767	4,058,067

For the storage of perishable goods, there were 128 cold storages with a capacity of 2.04 Lakh tonnes by 1973-74. These number 138 in 1976-77 and had a total capacity of 2.235 lakh tonnes. During 1976-77, the National Cooperative Development Corporation provided financial assistance of Rs. 83.58 lakhs for starting 6 new co-operative cold storages with a capacity of 1,5000 tonnes in U. P. (3) and West Bengal (3). The bulk of the cold storages organised in the co-operatives are located mainly in U. P., Punjab, Bihar and Orissa. Most of these store potatoes. In Punjab, majority of the cold storages were organised as independent societies : while in other three states, they were set up as adjuncts to marketing societies.

7. Provision of Financial Assistance. They make advances to members on the pledge of produce and support them in interim periods between deposit of produce and sale. Against the deposit of goods, members may receive advances upto the extent of 75 per cent of the current market price. Under integrated scheme of rural credit, finance is given to agriculturists on condition that the produce which would undertake to recover the instalments due to the credit society is sold through the marketing society. Members may deposit the produce direct to them or to credit societies which might store the same in godowns of marketing society. This link between credit and marketing assists the credit societies in the recoveries of their productive loans. At the same time the arrangement helps the marketing societies in the collection of agricultural produce by utilizing the credit societies as their agents.

8. Manufacture of Implements. These societies also manufacture agricultural implements. There were 26 co-operative societies in Gujarat, Haryana, M. P., Karnataka, Tamil Nadu, U. P., Bengal, Maharashtra and Rajasthan.

9. Foreign and Inter-state Trade. The NAFED undertook the export business to the tune of Rs. 21.2 crores in 1976-77 as against Rs. 197.85 lakhs in 1973-74 Rs. 97 lakhs in 1972-73 and Rs. 5.26 crores in 1970-71. It exports pulses, ground-nuts, chillies, ginger garlic, cardamoms to 22 countries including U.K., U.S.A. U.S.S.R. Kuwait, Canada, France, Japan and Singapore, and many other countries.

Inter-state trade in agricultural commodities was done to the value of Rs. 868 lakhs in 1976-77 as against Rs. 783.39 lakhs in

1973-74 Rs. 227.96 lakhs in 1972-73. These commodities are coffee (in Karnataka) : pulses, gram, peas, sanhemp, grains, tea etc. (in U. P., Andhra Pradesh and Kerala) ; Mustard seed (in Gujarat). The total value of agricultural produce handled by the co-operatives in the inter-state trade was of the order of Rs. 17.41 crores in 1973-74, and Rs. 30.53 crores in 1976-77.

10. Other Activities. The other benefits and functions of co-operative marketing societies are : (i) They protect members from several malpractices like unauthorised deduction, incorrect weighments, etc. They also eliminate the long chain of middlemen and connect the producer with the consumer. (ii) Co-operative marketing reduces waste and stands for fair trading practices and uses its influence against rings and manipulation of prices. (iii) Co-operative marketing teaches the farmers business methods and serves them as agencies for supplying market information. (iv) Marketing societies stabilize prices over long periods by adjusting the supply according to market demand. In this way seasonal fluctuations of price or their evil effects can be eliminated.

Co-operative Marketing Under Plans

The First Five Year Plan emphasised that co-operative marketing should be encouraged in all possible ways, but no specific targets were laid for its expansion. The value of agricultural produce marketed by all co-operatives during 1955-56 was only Rs. 53 crores as against Rs. 47 crores in 1950-51. "During most of the First Plan period, co-operative marketing continued to remain more or less a neglected field."

During the Second Five Year Plan, on the recommendations of the State Ministers' Conference on Co-operation (1955), some definite targets for expansion of co-operative marketing were laid down for the first time. By the end of 1960-61, it was hoped that at least 10 per cent of the produce sold in every mandi would be handled by the marketing society. It was envisaged that 1800 primary marketing societies should be organised in important mandies and an apex marketing society in each state as Central organisation to co-ordinate the activities of the primary societies be organised. During the Plan period, 1869 primary societies were organised and apex marketing societies were set up in all states. A National Agricultural Co-operative Marketing Federation was also set up. By the end of the Plan period, there were 24 apex marketing societies, 171 central marketing societies and 3,108 primary marketing societies. The co-operatives handled agricultural produce worth Rs. 174 crores. But the progress was not satisfactory as nearly 50 per cent of the total value of agricultural marketing was represented by sugarcane.

During the Third Five Year Plan, the main task was to strengthen the marketing structure and also to set up 544 new marketing

societies. The target of marketing of agricultural produce worth Rs. 360 crores was laid down. 980 additional godowns were to be set up. During the Plan, 452 additional primary societies were organised and State partnered.

The Fourth Five Year Plan aimed at handling agricultural produce worth Rs. 900 crore. It emphasised on strengthening the existing co-operative marketing societies and on grading and pooling of produce,

**Value of Agricultural Produce Marketed by Co-operatives
(crore rupees)**

State/Union territories	1968-69	1971-72	1972-73	1973-74	1976-77
1. Andhra Pradesh	23.49	12.58	1298	20.00	23.33
2. Assam	9.65	14.17	14.98	12.00	50.12
3. Bihar	7.36	14.34	14.34	15.00	18.23
4. Gujarat	57.20	91.84	95.64	128.00	82.03
5. Haryana	14.41	34.22	30.82	22.00	75.27
6. Himachal Pradesh	1	1.10	1.24	1.51	2.22
7. Jammu and Kashmir	0.65	1.88	1.88	4.00	3.08
8. Karnataka	26.37	42.62	42.62	61.00	103.10
9. Kerala	8.23	14.38	14.38	11.60	44.60
10. Madhya Pradesh	11.72	23.45	24.18	30.00	33.27
11. Maharashtra	168.66	193.64	408.56	360.00	320.56
12. Manipur	1	0.08	0.04	0.15	0.18
13. Orissa	1.62	2.74	0.99	4.00	7.00
14. Punjab	76.12	240.02	164.11	225.00	112.51
15. Rajasthan	3.47	7.85	7.85	20.00	29.63
16. Tamil Nadu	25.25	19.84	19.84	25.00	34.87
17. Tripura	1	0.15	0.27	1.40	0.84
18. Uttar Pradesh	145.64	124.79	210.62	140.00	230.34
19. West Bengal	6.91	2.00	2.85	18.00	13.38
20. Union Territories	2.51	2.00	1.28	2.42	3.95
Total	588.46	843.69	921.22	1102.46	1189.15

(Source ; *Draft Fifth Five Year Plan, 1974-79 Vol. II, and Annual Report of the Ministry of Cooperation for 1972-73, p. 130. Report of the Department of Civil Supplies and Cooperation for 1977-78, p. 139.*)

In the Fifth Five Year Plan, main emphasis was on the consolidation and strengthening of existing societies. New societies will be organised only in cases where new secondary markets come up. Separate marketing societies for plantation crops, lac, and fruits and vegetables shall be started.

Evaluation of the working of Cooperative Marketing Societies

The marketing societies have not done well. The Reserve Bank's study has pointed out that in none of the fields for which they were organised, the performance has been encouraging. "Of

the 142 societies surveyed, 15 per cent did not report any type of business activity. Only 28 per cent reported advancing of loans, marketing of agricultural produce and distribution of supplies. The sale effected by marketing societies constituted a very insignificant proportion of the total produce coming into the market. Few cultivators sold their produce through marketing societies. Most of the societies did not effectively cover all the villages in terms of membership of growers and collection of agricultural produce. There have been regional imbalances in the limited progress made by these societies. U. P., Maharashtra, Gujarat and M. P. accounted for 60 per cent of the value of agricultural produce marketed by cooperatives. Most of the societies have not made any attempt to grade or pool members' produce."

The main reasons for the defective working of the marketing societies have been :

(1) The inadequacy of working capital. (2) Lack of facilities for processing of produce. (3) Out of date methods of marketing which offer no incentives to producers, (4) Lack of confidence of the members in the society's personnel. (5) Absence of adequate and expert technical advice, (6) Inadequate and underdeveloped state of transport facilities, (7) Defective loaning policies, (8) Dominance of traders and non-cultivators as members of the society, (9) High operational costs of the societies, (10) Lack of trained and efficient staff, (11) Lack of support and guidance from apex marketing societies. (12) Unremunerative price offered to cultivators as against price obtained on open market. (13) Concentration on distribution function at the cost of marketing activities.

Observations of the Committee on Cooperative Marketing

An expert committee was appointed in 1964 under the chairmanship of Dr. Dantwala to : (i) review the present pattern of cooperative marketing of agricultural produce ; (ii) distribution of production requisites and supply of consumers articles. (iii) to indicate the future pattern of development with particular reference to *interse* relationship between the organisation at different levels and (iv) to indicate the role of cooperative marketing in an integrated structure of credit, supplies and processing, etc.

The Committee emphasised that all primary agricultural credit service societies in the area of operation of a primary marketing society should be affiliated to that society. This should be possible through a phased programme and each of these societies should be required to contribute to the share capital of the marketing society, at the rate of 2 per cent of its annual turn-over in the preceding operative year. Efforts should also be made to collect annually 1 per cent of the value of sale by each member, towards the share capital of the society irrespective of the fact whether the produce was brought by him direct or through a credit society.

The more important recommendations of the Committee are :

(i) The future pattern of organisation of marketing co-operatives should be three-tier structure with the apex society at the State level, primary marketing societies at the mandi level, and branches of apex marketing society at district or regional level.

(2) In states where a three-tier structure already exists, the existing District Federation should not be disturbed,

(3) The marketing co-operatives should undertake both agricultural marketing and the distribution and supply functions,

(4) Immediate steps should be taken to locate the primary marketing societies at the mandi level.

(5) The membership of the primary marketing societies should consist of mixed type, i.e., of the village service credit societies and individual growers,

Suggestions for Improvement

1. Marketing societies should be located at the mandi centres, and the area of operation should be the hinterland of the markets concerned,

2. Organisation of societies should be on democratic lines. Producer-cum-trader should not be allowed to become full members.

3. Training facilities should be provided for managerial and other personnel.

4. The finances of the societies should be improved by enrolling more individuals as members and by collecting additional share capital from primary agricultural societies.

5. Grading and processing should be developed and produce marketed only after grading and processing is done.

6. Godowns should be provided by the societies with financial assistance from the Government.

7. The State Bank of India should give high priority to the requirements of these societies,

8. The Reserve Bank of India should allow the State Bank of India to borrow from it additional funds to enable the latter to meet the requirements of marketing societies.

9. There should be greater coordination between many farming and credit societies for the success of different types of cooperative organisation.

10. Existing potentially viable societies should be revitalised while defunct societies should be liquidated.

11. New societies should be organised at the different regional levels in areas of concentrated production of commercial crops, fruits and vegetables.

12. Marketing societies must arrange to market purchases, particularly from small grower-members undertaking sales on commission basis.

Agricultural Price Structure

Fluctuation in Agricultural Prices : Causes and Impact

Agriculture produces food-stuffs and raw materials, the demand for which in the aggregate is relatively stable in the short run, while the supply of agricultural products fluctuates widely from year to year, and from one part of the year to another, on account of the variations in yields, due to (i) seasonal and weather conditions, (ii) variations due to supplies being more abundant in certain months of the year, (iii) deliberate variations attempted by the producers, and (iv) variations arising out of conditions of marketing. These fluctuating supplies constitute the most important factor responsible for the wide fluctuation in agricultural prices. These fluctuations in the price of agricultural products are the greatest hurdle in the way of agricultural development, for they bring ruin to many. It was for this reason that agricultural countries suffered during the depression of 1929. According to Sir Roger Thomas, "next to rain, price changes have been the greatest enemy of the farmer."

Most farmers cannot ordinarily adjust, in response the changes in the price level, the quantity and quality of their output by altering the quantity and quality of the input. Unlike in industry, nature plays a very significant role in agriculture in the determination of the quantity and the quality of the output. Farming is a biological process and there is a greater time-lag between the changes in prices and adjustments in production. Moreover, farming is often a complementary enterprise so that certain products have to be included in the production schedule not because they can be produced at the lowest unit cost but because they increase the overall profitability of the farm. Technical efficiency in farming is not, therefore, synonymous with the economic efficiency.

In the production of most farm products, the overhead costs form a relatively large proportion of the total costs than the variable costs which determine the quantity of the output. The entire cost structure in agriculture is relatively rigid and moves more slowly than the level of prices, especially in times of falling prices. The position is made worse by the slow turnover of agriculture. In times

of falling prices, therefore, a farmer cannot save much by reducing the quality of his production. He may actually increase his production and sales with an attempt to maintain his money income and this will itself tend to lower prices further. This is especially true of peasant farmers carrying on agriculture with family labour, as a way of life rather than as a business, buying only small quantities of raw materials and among whom competition is more or less perfect. Cyclic fluctuations in agriculture, therefore, reflect themselves not so much in the variations in the output and employment, as they do in industry as in the change in the farm products and prices. It is, therefore, inadvisable to leave agricultural prices to seek their own levels and it is necessary to resort to corrective measures for arresting the fall in prices not only for securing stable price incomes to the farmers but also for securing some stability for the entire Indian economy of which agriculture forms the very base, as about 70 per cent of the total population is still engaged in agriculture

Price Stabilisation—Its Meaning //

A disquieting feature of Indian agricultural economy is the uncertain trend in the movement of price of agricultural commodities. Success of agricultural development programmes has long been hindered for want of stabilised agricultural prices. The Famine Enquiry Commission observed, "Given price stability, much can be done by linking up credit, agricultural improvements and marketing so as to supply the facilities needed for agriculture, whether water or manure or seed or machinery or organisation. Without it we are building on sand."

Price stabilization is not the same thing as holding the price line. It is a much broader concept and signifies a policy aiming at prevention of violent fluctuations in the prices on both sides. It consists of measures that the Government might take to prevent a fall or rise in prices if and when it occurs. The Government measures consist of buying all that is offered for sale at the predetermined minimum support prices in a bid to prevent undue fall in prices and selling the reserve stocks at control rates to check a rise in prices beyond what is considered a fair level.

Price stabilization is to be clearly distinguished from various forms of farm relief and legislative measures which are introduced with the idea of raising domestic price levels. As pointed out by the Businessmen's Commission of 1927 on Agriculture in U. S. A. "Real price stabilization would affect a mitigation in price fluctuation, but this would involve scaling down of the heights of prices as well as an elimination of their depths. Though this would not make an incompetent producer rich, it would prevent the ruin of reasonably efficient farmers whose production is really needed and who tend to be replaced by new comers liable to suffer from the same fate."

1. *The Famine Enquiry Commission*, 1945, p. 285

Price stabilization of agriculture would thus enter into the wider field of stabilised income and stabilised wages of not only those engaged in the field of agriculture, but also the mass of non-agricultural workers as well. It would also further raise the productivity of the soil.

The Need for Stabilization of Agricultural Prices

The importance of fixing fair prices for agricultural products cannot be over-emphasised in India for unless the producers get fair money for their marketable surplus, no increments in efficiency and amount of production can successively raise the standard of living of the masses. Time and again this fact has been recognised that "when a general expansion of agricultural production is aimed at a guarantee of minimum price is an effective measure to adopt and it forms, therefore, an essential part of the policy of agricultural development". This effective guarantee of a minimum price introduces not only an element of stability in agriculture but also promotes stability in other spheres of economic life. The *Famine Enquiry Commission*, 1945, observed that "a fair return to the cultivator is one of the foundations not only of agricultural prosperity but general prosperity also."

The *Co-operative Planning Committee* under Shri R. G. Saraiya (1944) had observed thus : "While the risks are high in lines of production they are particularly serious in the sphere of agriculture because of the vagaries of the monsoon, the inelasticity of production, the large number of small producers and wide range of price fluctuations. Moreover, the fluctuations in agricultural prices in particular imbalances the whole economy of the country since they affect the incomes of more than 70 per cent of the population thereby affecting the demand for all types of commodities. Besides, they also influence the prices of industrial goods through their effects on the costs of living and on costs of raw materials. The State must, therefore, adopt a policy of actively supporting agricultural prices within a range which is fair both to the producer and the consumer if a slump is to be avoided in the next few years, if stability is to be introduced, in the whole economic system, if the risk involved in production, trading and processing are to be reduced to manageable proportions and if the co-operative movement is to be enabled to compete with other forms of enterprise to a greater success."

The *Price Sub-Committee on Agricultural Prices* (under Shri Krishnamachari) recognised the need of stabilization of agricultural prices on the following grounds :

- (1) In order to protect the farmer from heavy losses due to vagaries of the weather and damage by insect pests and price fluctuations, prices should be guaranteed with a view to securing comparative stability of agricultural incomes and prices so that a reasonable parity

is established between the agricultural and industrial incomes.

- (2) To safeguard the interest of the consumers, it is necessary that prices should be prevented from rising beyond a prescribed maximum. Such prices should be fixed within a range which would be fair both to the producer and the consumer and capable of being put into practice.
- (3) The fair price should be such as would leave to the producer an income sufficient to maintain him and his family at a reasonable standard of living. This fair price should cover the cost of production.
- (4) The minimum price for a commodity should be calculated for principal producing areas on the basis of Fair Average Quality (F.A.Q.) of the product. Suitable differentials should be allowed in respect of different grades and qualities. The minimum price of other areas should be worked out by adding to this figure the normal cost of transport, marketing and other incidental expenses. The maximum price should be based on the minimum price, making allowance for the normal trade differences, the storage charges and the market fluctuations in supply and demand. The maximum price should not be lower than the parity price. It should be fixed at 25 per cent above the minimum price or, alternatively, at the fair parity price, whichever level is higher.
- (5) The fixation of minimum price would require that the Government should guarantee to purchase all supplies offered to it at that price at an adequate number of marketing centres within an easy access to cultivators in order to enforce prices at the minimum level. The State may regulate the foreign trade by means of quotas, tariffs and State trading,
- (6) When prices move above the prescribed maximum the State should provide supplies to the market by sales from its own stock at a price not exceeding in maximum. In order to prevent the prices from rising above the maximum, the State should have power to requisite stocks to regulate the distribution of supplies and to enforce the control of prices by law in an emergency.
- (7) The State should have special powers to regulate acreage under individual crop in a particular area on an all-India basis and to enforce adequate standards of land management.
- (8) The minimum and maximum prices should be fixed up for principal foodgrains like wheat, bajra, jowar, as their prices are likely to influence those of other foodgrains. The principles of price policy recommended for food

crops should also apply to commercial crops and the mode of implementation would have to be modified to suit the special circumstance of each crop. For animal husbandry products the price should be regulated by the State Government on a regional basis.

When the *First Five Year Plan* was formulated, the prices of wheat and rice were 5 to 5 1/2 times higher than the pre-war level. It was, therefore, not surprising that the Plan was concerned with ensuring that the prices of foodgrains are held stable at levels within the reach of the poorer sections of the community. The Plan described the price problem as "to define a level which may be considered reasonable under given circumstances, and to ensure through direct controls or through fiscal and other devices that producer of foodgrains is not placed at an undue disadvantage." It further said, "A policy of price stabilization must have in view certain maxima as well as certain minima. At a time when the economy is subject to inflationary pressures, the emphasis is inevitable on the maintenance of the maxima. But if the trend of prices is persistently downward, a system of controls with defined procurement prices can be used to safeguard the interest of production by preventing prices from falling unduly. Judicious purchases by Government at defined prices are thus an excellent device for stabilizing prices and for levelling out the inter-State disparities."

Subsequent Plans have reiterated this policy with only some minor changes in emphasis. The *Third Five Year Plan* stated: "The producers of foodgrains must get reasonable return. The farmer, in other words, should be assured that the prices of foodgrains and other commodities that he produces will not be allowed to fall below a reasonable minimum.....The farmer should have necessary incentive to make these investments, and to put in a larger effort. The policy designed to prevent sharp fluctuations in prices and to guarantee a certain minimum level is essential in the interest of foodgrains production.....The other objective no less essential, is to safeguard the interest of the consumer, and, it is particularly necessary to ensure that the prices of essential commodities such as foodgrains do not rise excessively. Government must always be in a position to regulate effectively the course of foodgrains prices."

The *Fourth Five Year Plan* provided for "assurance of minimum prices for major agricultural commodities for securing a higher rate of increase in production of foodgrains and major commercial cropsSo long as the general trend of prices was towards a rise, guaranteed minimum prices which were bound to be invariably lower than market prices, had little use for the farmer. But with the rapid increase in agricultural production that may result from the New Strategy, the danger of a precipitate fall in prices cannot be ruled out. This should be avoided because any appre-

cial fall in prices is likely to stand in the way of the farmer using costly inputs and new technology for raising farm output. The guaranteed minimum price scheme, therefore, becomes a part of the programme of providing incentives for increased production."¹

Objectives of the Price Policy

The objectives of a price policy in a country, at any time, are defined by the nature of the problems that the country is facing. In U. S. A. and other developed countries the chief object of the price policy is to prevent any drastic fall in agricultural incomes resulting from the surplus production and decline in prices. In developing countries like India, its concern is to increase agricultural production. The chief objectives of agricultural price policy would be :

(1) To ensure a reasonable relationship between the prices of food-grains and non-food-grains and between agricultural commodities and manufactured articles that the terms of trade between these two sectors of the economy do not change too sharply against one or the other. As Dr. Madan has pointed out : "The sectoral relationships of prices have an important bearing on production and have to be borne in view in considering the general farmwork of price-policy."

(2) To maintain an appropriate relationship between prices of competing crops so as to fulfil the production targets in respect of different commodities commensurate with the rise in demand.

(3) To achieve a balance between the economic interests of producers and consumers, (i.e., reduce the margin between the producers' price and consumers' price) by permitting prices to fluctuate only within a maximum and minimum range.

(4) To smooth cyclical fluctuations of price and reduction of seasonal fluctuations in agricultural prices to the minimum.

(5) To bring about greater integration of prices between the various regions in the country so that a regular flow of marketable surplus could be maintained and exports of farm products stimulated. The necessity for regional price integrations stems from the fact that with the "progressive integration of the national economy and the objective of doing away with unnecessary regulation requires that as a long term aim, we must move towards a uniformity of producers' prices and that the differences in these prices from region to region should not be higher than warranted by reasonable calculation of transport and other costs."²

(6) To stabilize the general price level in the face of an increasing public outlay to bring about economic development.

1. *Draft Fourth Plan*, pp. 130-131.

2. Gadgil, D. R., "Agricultural Price Policy—A Stable Basis for Achieving Targets," *Yojana*, Republican Number, 1961.

(7) To ensure a proper price relation between the commodities produced by the cultivator and the input required by him for agricultural production and his consumption.

(8) To encourage production of various commodities needed by the country to improve people's diet and to provide raw materials for running industries.

(9) To protect the interest of the consumer by enabling him to procure food-stuffs at fair prices. If the food-prices are high, wages go up, industrial costs rise, the cost of production of goods as well as consumption articles required by the farmer goes up. Thus an inflationary spiral sets in.¹

Thus, the price policy must ensure that agricultural production is economic both in the widest and in strictest sense of the term. *In its narrow sense*, economic production would mean that costs are reduced to the minimum, that the agriculturists have a fair margin of profits and that the costs of agricultural products, foodgrains and raw material as they enter into the costs of living and the prices of manufactured articles either in the internal or external markets are on healthy levels. *In the wider sense*, economic production would signify the widest distribution of scarce land resources among the various competing ends; forestry, pasturage and cultivation in the first instance and, secondly, between food crop and cash crop. The policy should not restrict consumption or reduce the incentive to farmers to adopt more efficient methods of production. It should not involve heavy subsidy payments to large and efficient farmers who could produce profitably without them, in order to maintain the incomes of small or less efficient farmers at a reasonable level.

Regulatory Measures

Stable prices do not mean rigid and unchanging prices. Secular trend in prices do not call for much interference but sharp cyclical fluctuations require adoption of specific measures for stabilization, minimum and maximum prices for different commodities for specific periods are generally fixed and enforced. Through regulatory measures prices are not allowed to fall below a certain minimum in order to protect the farmers from undergoing loss; rise above a certain maximum is also not allowed in order to safeguard the interests of the consumers.

The states can take initiative action in any one of the following ways :

1. *Statutory fixation of minimum or maximum prices or both.* In fixing these prices the interest of the producers and consumers is reconciled. From the producers' point of view, the minimum price should cover the cost of production and provide a fair margin of

1. P. C. Bansil, "Price Policy for Agricultural Development," *Indian Journal of Agricultural Economics*, Jan., March, 1962, p. 30.

profit. from the consumers' point of view, the maximum price should not be too severe and should give rise to a demand for the whole quantity produced. As the agricultural production in India is in the hands of millions of private producers and the Government has very little direct control over production, such prices are generally maintained through some sort of open market operations. Further, the minimum and maximum fixation presupposes a supplementary storage policy. Storage is an effective means of counteracting cyclical changes in the level of production. It means the maintenance of an all-time normal granary. It must also include such means as crop insurance or some income compensating devices. The minimum and maximum prices are announced in advance of the crop planning period ; and simultaneously for products competing for the same resources.

(2) *Guarantee to buy the farm products at declared prices if the prices fall below the minimum fixed by the State.*

(3) *Indirect control on prices when prices tend to cross the ceiling by releasing stock in the market and by purchasing stocks when the prices show a tendency to fall below the minimum.*

(4) *Regulation of movement of stocks by stopping exports from, or imports into the country or by imposing restrictions on the movements of produce internally from a region defined for the purpose to another region.*

(5) *Controls of supply and rationing of its use to regulate consumption in special circumstances.*

Such measures entail a number of measures like licensing of traders, declaration of stocks by the traders and a statutory limit on stocks held by them, compulsory levy on the farmers or procurement from them at fixed prices.

Beginning with a temporary requirement for controlling the rise of foodgrains prices, the Central and the State Governments of India had to adopt most of these measures to deal mainly with the food situation.

~TRENDS IN AGRICULTURAL PRICES

The Second World War Period

Declaration of the outbreak of war gave a spurt to the rise in prices which increased from 100.03 in August 1939 to 137.8 in December, 1939. Since this rise in prices was mostly speculation oriented, it began to fall touching 108.4 in August, 1940. Thereafter rise of prices became a permanent feature of the Indian economy touching the height of 145.6 in 1945-46. Maximum price rise was recorded in the case of agricultural commodities (127.5 in 1939-40 to 272n. in 1945-46) followed by primary commodities (124.6 and 246.6) and manufactured articles (131.5 to 240.0) and raw materials (118.8

and 210.1), against the base year August 9, 1939. Rising prices were attributed to : (i) Increase in export of consumer goods especially to British Empire countries ; (ii) Blockade of import of food grains rice from Burma ; (iii) Decline in production of rice due to Bengal famine ; (iv) maldistribution of commodities due to loose implementation of rationing and price control ; (v) hoarding and stockpiling by traders and other agencies ; (vi) increased supply of money.

Independence and After

After the partition of the country, there developed an acute shortage of foodgrains in the country, for many of the wheat and rice growing tracts had fallen to the share of Pakistan. The prices, therefore, showed a sharp rise. During 1952 to 1955, there was, however, a break and decline in these prices. An upward turn in prices started again in 1956, and continued till 1962-63. The rise was gradual and spread over evenly over the period. From 1963 to 1967 a serious rise in prices was noticed.

Several factors were responsible for price rise during the period 1947-1967. The policy of decontrol in December, 1947, was immediately followed by rise in prices of foodgrains, cloth, sugar and other necessities of life. The wholesale price index of food articles rose from 306.1 in 1947-48 to 382.9 in 1948-49, and the index for all commodities rose from 308 to 376, at the base level of 1939. Devaluation of the Indian rupee in September, 1949 further led to rise of index of food articles to 391.3 and general index to 385.4 in 1949-50. When the Korean War broke out in June, 1950, there developed stockpiling and speculative boom in the prices of industrial raw materials and other agricultural produce. The general price index rose sharply to 409.7 in 1950-51 and 434.6 in 1951-52. The index of industrial raw materials went upto 523 in 1950-51 and 592 in 1951-52.

Price began to fall after the cessation of hostilities in Korea and a succession of good crops in the country from 1952-53. The general index fell from 434.6 in 1951-52 to 377.4 in 1954-55 ; that of raw materials from 592 to 436.2 and of food articles from 398.6 to 339.8 during the same period.

In 1955-56 and afterwards was noticed an upward trend in prices, the immediate cause being the Suez Crisis, but the rise was sustained over next four years by massive investments in industrialization under the Plan—which expanded money supply by about 53% in eight years ending in May, 1963. Added to this, the deficit financing to the extent of Rs. 948 crores was undertaken during the Second Plan period. Further expansion of money supply and bank credit since and after the Third Plan, and the increased economic activity, for defence and development purposes, tended to manifest themselves through various factors on the demand side of foodgrains. They created additional purchasing power in the hands of the people thereby bringing about a change both in the volume and pattern of food

consumption of many sections of people. The rapid growth of population and the shifts of tastes from inferior to superior cereals tremendously increased the demand for foodgrains. The change in the "propensity to stock" also affected the demand side. In 1955-56, most of the stock piling was done by the traders but in 1956-57, there was a significant change and a large part of stock-holding was done by big and medium producers. This created an artificial shortage in addition to the basic real shortages that already existed. The rapid process of industrialisation and a spurt in the rate of urbanization called for the progressive stepping up of marketable surplus in foodgrains, but this did not happen due to inadequate institutional changes and defective agricultural planning. Uptil 1962-63, market arrivals of foodgrains increased and decreased normally with production. But during 1963-64, the farmer's market supply behaviour became somewhat abnormal. Rice production increased by 11% over the previous year but market arrivals decreased by 16%. For wheat, the production declined by 10% but market arrivals decreased by 21%. This abnormality was due to defective Government policy.

The general price index (base : 1952-53=100) rose from 92.5 in 1955-56 to 105.3 in 1956-57, 112.9 in 1958-59 and 124.8 in 1960-61. In the case of food articles the rise was from 86.6 in 1955-56 to 102.3 in 1956-57, 115.2 in 1958-59 and 120 in 1960-61. There was a spectacular rise in prices after 1962, due to the lean crop of 1962-63 and the declaration of National Emergency and reimposition of food control measures. In 1962 the support prices for rice and wheat were fixed and arrangements were also made for the purchase at support prices in case market prices tended to decline unduly. In December, 1962 procurement of rice was intensified. With effect from 1963-64 crop support measures were also extended to jowar. Agriculturally 1965-66 and 1966-67 were bad years. Prices and other controls were further tightened up.

Index No. of Wholesale Prices (Base 1952-53=100)

	All com- modities	Agr. com- modities	Food articles	Industrial Raw materials	Manu- factures
1950-51	111.8	—	112.5	130.9	101.88
1951-52	118.8	118.8	111.0	141.5	100.7
1953-54	101.2	—	100.1	107.4	100.1
1954-55	89.6	—	82.1	94.6	99.6
1955-56	92.5	88.0	86.6	99.0	99.7
1956-57	105.3	104.5	102.3	116.0	105.3
1957-58	108.4	107.4	106.4	116.5	108.1
1958-59	112.9	114.0	115.2	115.6	180.4
1959-60	117.1	116.5	119.0	123.7	111.7
1960-61	124.9	123.9	120.0	145.4	123.9

1961-62	125.1	122.8	120.1	142.6	126.9
1962-63	127.9	123.3	126.5	136.5	108.9
1963-64	135.3	132	136.8	139.5	131.1
1964-65	152.7	156	158.9	162.7	187.3
1965-66	165.1	163	68.1	189.1	149.1
1966-67	191.0	199	199.8	228.6	163.0
1967-68	212.6	242.2	222.8	220.5	165.5
1968-69	209.5	234.9	907.4	215.1	166.3

Agricultural Prices Commission

The appointment of the *Jha Committee on Foodgrains Prices* on 1st August 1964 marked the beginning of a new phase in the evolution of agricultural price policy in India. The Committee was asked to render advice on the fixation of prices of rice and wheat for the 1964-65 season and also advice on terms of reference which would be suitable for an agency to provide such advice on continuous basis in respect of future seasons, the suitable form of such agency and the kind of personnel it should have.

On the basis of the recommendations of the Committee suitable producers price for standard varieties of coarse paddy were announced for the 1964-65 season and State Governments were authorised to do the same for other foodgrains. This was done with an idea of guaranteeing a reasonable price to the farmer to act as an incentive to greater production and to provide protection against undue decline in prices.

Because of short fall in production of foodgrains during 1965-66 and 1966-67, the system of rationing had to be introduced besides maximising the internal procurement. The supply position of foodgrains improved during 1967-68 and 1968-69 and, therefore, some of the controls on distribution and movement of foodgrains were relaxed.

Following the Report of Jha Committee, the Agricultural Prices Commission was set up in 1965 to advise the Government "on the price policy of agricultural commodities particularly paddy, rice, wheat, jowar, bajra, maize, gram and other pulses, sugarcane, oilseeds cotton and jute with a view to evolving a balanced and integrated price structure in the perspective of the over all needs of the economy and with due regard to the interest of the producer and the consumer."

The Commission is to keep under review studies relating to the price policy and arrangement for collection of information regarding agricultural commodities and other data : (ii) suggest improvement in these arrangements ; (iii) review the developing price situation and make appropriate and timely recommendations within the framework of the overall price policy, examining wherever necessary, the prevailing methods and costs of marketing agricultural commodities in different regions ; (iv) to suggesting measures to reduce the costs of

marketing, recommending fair price margins for different markets; (v) the need to provide incentive to the producers for adopting improved technology for maximising production; (vi) the need to ensure rational utilisation of land and other production resources and (vii) the likely effect of the price policy on the rest of the economy, particularly on the cost of living; level of wages, industrial cost structure etc. It is also the responsibility of the Commission to make the price policy effective in respect of different commodities. The Commission has close liaison with the other agencies connected with its work including the Steering Group on Wages, Incomes and Savings policy and Food Corporation of India.

Recommendations of the Commission

The Commission's main recommendations were :—

- (i) Whatever the policy regarding inter-State movement of foodgrains, the Government should acquire 15 to 25% of the marketable surplus every year in the next 5 years so that fair price shops could be retained.
- (ii) A levy in both the surplus and deficit states should be introduced. If there are no movement restrictions, the levy has to be applied uniformly throughout the country to the marketable surplus of all paddy producers and the quantity with the millers. In the event of single-state zones continuing, the aggregate levy ratio should be higher than 25% and the levy should be higher in the surplus states than in the deficit states.
- (iii) Immediate steps should be taken to make a realistic assessment of the surpluses and deficits of foodgrains for each State on an objective basis and draw up a comprehensive national food budget.
- (iv) A major part of public stocks must be procured through a system of levy on producers and millers.
- (v) Monopoly purchase or procurement by the government would not serve any purpose because the quantities thus acquired will fall short of the requirements of the non-producer consumers.
- (vi) The system of single state zone is favoured by the Commission.
- (vii) To achieve the objective of price stabilization and give relief to consumers more fair-price shops should be opened, especially in traditionally high price pockets and supplies should be stepped up in the lean months and scaled down in the post harvest months.
- (viii) Regarding price control, only the prices for government purchases of rice should be fixed, the rest of the marketable surplus should be allowed to be sold at the open

market prices. In the absence of sufficient stocks, maximum wholesale prices are difficult to enforce, and such enforcement is needed most.

- (ix) A two-price regime with one price applicable to public sector transactions and the other to private sector transactions—appears to be a necessity. The necessity arises from the fact that if the State undertakes to supply food through fair-price shops, at a price lower than the market price, then it must also purchase a part of the total supply at a price below the market price.
- (x) The overriding purpose of price policy in the surplus states must be the maximisation of market arrivals. Since this purpose was defeated by the fixation of maximum prices for private transactions it was desirable that normally no maximum prices should be fixed.

Since May 1965 the Commission has been tendering advice on a continuous basis on minimum and procurement prices of both kharif and rabi cereals. In 1967, the Commission recommended the fixing of prices of paddy in 1967-68 season at practically the same level as the prevailing prices at the beginning of the 1966 season in different states. These prices varied from Rs. 42.50 per quintal in Orissa to Rs. 46 per quintal in Bihar, W. Bengal, Kerala and Maharashtra. The same story was repeated in the fixation of wheat prices. Procurement prices for wheat recommended by the Commission ranged between Rs. 76 per quintal for Mexican wheat in Punjab, Rs. 79 in Rajasthan Rs. 86.90 in Haryana and Rs. 80 in U. P.

The new price policy announced for the year 1969-70 aimed to do away with the subsidies by fixing a uniform issue price of all varieties of wheat at Rs. 78 per quintal with effect from 1 May, 1969. As against this, the recommendations of the Commission were for a price of Rs. 66, Rs. 70 and Rs. 74 per quintal respectively for the red, common white and superior farm varieties and Rs. 70 per quintal for all the Mexican varieties, throughout the country.

The procurement prices for wheat in 1970-71, was fixed at Rs. 76 per quintal for all varieties except red variety. In the case of paddy/rice the procurement prices were marginally raised in Haryana, M. P., Tamil Nadu and Punjab. In other States it was maintained at 1969-70 level. As regards coarse Kharif cereals, a uniform price of Rs. 55 per quintal was fixed for purchases made for Central pool. State Governments were allowed to fix a higher price upto Rs. 57 per quintal for purchases made for their internal consumption.

In view of the policy of purchasing all quantities of fair average quality of foodgrains offered for sale at procurement prices announced by the government, it was not considered necessary to announce the minimum support prices for kharif cereals and for wheat for 1975-76 season. During the 1975-76 rabi marketing

season, the system of open market purchases by public agencies at the procurement price of Rs. 105 per quintal for all varieties of wheat was re-introduced (as in 1974-75) and the 50 per cent levy on purchases by licensed dealers in the surplus states imposed during the 1974-75 season was withdrawn. For the 1976-77 rabi marketing season, minimum support prices of wheat were not fixed. However, in view of considerable fall in prices of barley and gram, the government fixed a support price of Rs. 65 per quintal for barley and Rs. 90 per quintal for gram.

Procurement prices are fixed for purchasing the quantities needed by the government for maintaining the public distribution system and for building up the buffer stock since 1978, the government has been purchasing all quantities of foodgrains of fair average quality. Procurement prices for the 1976-77 season (for kharif and rabi crops) were maintained at Rs. 74 per quintal as in 1974-75 and 1975-76.

The procurement price for wheat for the 1977-78 marketing season has been increased from Rs. 105 to Rs. 110 per quintal for paddy, the procurement price for the kharif marketing season 1977-78 has been raised from Rs. 74 to Rs. 77 per quintal for coarse variety, with similar increases in the corresponding prices of other varieties with a view to giving a fillip to the production of grain, the support prices for the rabi season have been increased from Rs. 90 per quintal to Rs. 125 per quintal.

Foodgrains Enquiry Committee's Observations on Prices

The Foodgrains Enquiry Committee (with Shri Ashok Mehta as Chairman) was set up in July 1957. The Committee recommended that prices of foodgrains can be successfully controlled only through controlling of demand and supply of foodgrains. The idea underlying is "the purchase of stocks in the harvest season and selling the same in the market at a reasonable price in the lean season is an effective way of preventing undue seasonal rise in prices. If a part of the excess production of a bumper year is carried over to meet the deficit in a subsequent lean year much of the distress resulting from the price fluctuation can be avoided and a measure of needed resilience imparted to the market."¹

In a period of rising prices direct sales of cereals is necessary through modified ration shops and limited compulsory procurement by Government in surplus areas for replenishing its reserve stock. In a period of sharp deflationary trends, on the other hand, the action to be taken should include announcement of guaranteed minimum prices supported by accelerated purchases of foodgrains in the given market by the Government, subsidies sale of fertilizers to farmers and acceleration of local development works in depressed areas. The Committee favoured the formal announcement and effective enforce-

1. *Report of the Foodgrains Enquiry Committee*, 1957, p. 77.

ment of minimum prices throughout the country as a necessary condition when there may be possibilities of prices falling sharply.”

The Committee viewed “that buffer stock operations can be most effective instrument for the stabilization of prices of foodgrains. Whenever prices tend to fall Government should step in and start purchasing at reasonable prices and sold to the State Governments for distribution through ration shops, cooperative societies or through the employer’s associations. Compulsory procurement should be made for replenishing the reserve stocks and maintaining supplies to vulnerable section of the population at reasonable prices by coindoning off certain areas and making the Food Grains Stabilization Organisation the sole buyer in these areas.”

The Committee recommended the setting up of a high powered authority, known as the Price Stabilization Board, for the formulation of policy and programme for price stabilization in general. It also recommended the establishment of Food Grains Stabilization Organisation to execute that part of the policy and programme framed by the Price Stabilization Board as may relate specifically to purchase and sale operations in foodgrains.

The Committee also maintained that “until there is a social control over the wholesale trade, we shall not be in a position to bring about stabilization of foodgrains prices. Our policy should be that of progressive and planned socialisation of the wholesale trade in foodgrains.”

State Trading In Foodgrains

In the light of the recommendations of the Food Grains Enquiry Committee the scheme of State Trading in Foodgrains was accepted by the Central Government in April 1959. The high-lights of the scheme are :—

The scheme falls into two parts, viz., *Interim Scheme* of state trading in foodgrains and its *ultimate pattern* of co-operative marketing of produce. The primary objective of the state trading is “to maintain price levels which are fair to the producers and consumers and to reduce to the minimum the spread between prices received by the farmer and the prices paid by the consumer throughout the season and over the agricultural cycle.”

In the interim period wholesale traders are permitted to function as licensed dealers who make purchases on their behalf but pay specified minimum prices to the farmers. While the government have the right to acquire the wholesale or a portion of the stocks from the licensed traders at controlled prices, the traders are at liberty to sell the remaining stocks to the retailers at prices not exceeding the controlled prices. They are required to maintain proper accounts of

their purchase and sales transactions and of their stocks and submit periodical returns to the state government.

The ultimate pattern of state trading provides the collection of farm surpluses through co-operatives at the village level and the channelling of surpluses through marketing co-operatives and apex marketing societies for distribution through retailers and consumers so that the ultimate objective can be readily realised.

Other features of this scheme are : In the initial stages state trading was confined only to the two major cereals, rice and wheat. (ii) To ensure that the producers get minimum prices, the government set up agency for making direct purchases of foodgrains from the producers. (iii) The purchase and sale operations as a whole was conducted on a 'no profit-no loss' basis. (iv) Uniform purchase price was generally fixed for a whole State or region. (v) While the state trading scheme provided for the sale of foodgrains by the wholesalers to retailers at controlled prices it did not fix retail prices. It left it to states to fix retail prices provided they were in a position to enforce them without causing any dislocation of or interruption in, supplies.

The Commission keeps under review studies relating to the price policy and arrangement for collection of information regarding agricultural policy, and other related data, suggesting improvement in these arrangements, reviewing the developing price situation and making appropriate and timely suggestions.

The Food Corporation was set up in 1965 to undertake purchase, storage, movement, transport, distribution and sale of foodgrains, procured more than 55 lakh tonnes of foodgrains out of 1969-70 crop as against 47 lakh tonnes in 1968-69. In 1970-71 kharif season it purchased about 81 lakh tonnes. In 1973-74, the quantity purchased was about 51 lakh tonnes.

The Corporation had a storage capacity of 1.95 crore tonnes as on 1 September 1977. Its turnover (purchases and sales) in 1976-77 was over Rs. 4,000 crores.

Criteria for Price Policy ✓✓

The price for agricultural commodities has to be formulated on a comprehensive and continued basis. *Ad hoc* measures to meet the exigencies of the situation would always suffer from the element of time lag and will fail in timely redress of the situation. Fixation of a minimum and maximum price for a few commodities without establishing a price parity among competing crops may only result in unbalanced production of each of them.

With due consideration to the production targets fixed, it should be decided at the very outset how much area is needed for different crops in different States. If a diversion of the area is needed from one to another crop, the price policy should be oriented in a way that

the desired shift takes place. Then detailed studies about the cost structure, determination of minimum fair prices and the relative parity prices should be undertaken. Along with this, the producers of various crops will have to be given assurance for the off-take of their produce at predetermined prices. For export commodities, some sort of minimum export quotas can be declared for a long time on the basis of past experience and trends of world markets.

An inducement for increasing agricultural production in general can be given only if the price policy aims at increasing the efficiency of the cultivator. This would mean the provision of fertilizers, manures, improved seeds, irrigation facilities, technical knowledge, credit co-operation. For increasing production of other products like milk, eggs, meat and fish, fruits and vegetables—which are perishable—not only statutory prices will have to be fixed but also measures such as marketing facilities, bulk handling and arrangement for sale on fixed price basis through co-operative or state organisation will have to be undertaken.

The stabilisation of prices may be termed as a core of any price policy for agricultural development. This can be accomplished only by a permanent agency which can formulate price policy and implement this policy with the required action. The Ford Foundation Team suggested that such an agency be given responsibility for the following :¹

“(i) determining base prices and the permissible range in variations from these prices ; (ii) announcing the prices well in advance of the sowing season ; (iii) initiating purchase or sale of foodgrains according to circumstances ; (iv) establishing the locations for stock of each foodgrains and the recommended supplies to keep in reserve ; (v) determining export and import duties and quotas and such other devices for controlling prices as may be necessary, and (vi) encouraging the development of an effective grading system.”

The Team also laid down criteria for price-fixing. It suggested that following factors should go into fixing minimum prices :

(i) the price should protect the cultivator against unduly low prices and losses ; (ii) the price should smooth out seasonal fluctuations by sustaining prices during the harvest season and ensure a smooth operation for the market by ironing out flux and scarcities except for those quantities required by the government for buffer stock operations ; (iii) the prices should be set at levels which would not harm the consumers ; (iv) they should be set at levels which would achieve required production and marketable surplus.

The price guarantees should be with reference to different foodgrains with due regard to competition from other crops and should

1. *Ford Foundation Report on India's Food Crisis and Steps to Meet It* p. 26.

also take into account the handling margins and fluctuations in production.

One of the first requisites in price stabilisation is to have a machinery for a correct prognosis of the trend of price and a timely diagnosis of the disturbing factors in the economy. This needs a continuous watch over the behaviour of a number of key indicators affecting the price situation. In this context, the following indicators recommended by the FAO-ECAFE centre on Policies to Support and Stabilise Agricultural Prices in Asia deserve mention :

(i) retail, wholesale and farm price of important commodities ; (ii) moving averages of wholesale prices on about a 5-year basis ; (iii) cost of living and general indices of retail, wholesale and farm prices ; (iv) ratio of indices of prices of important raw materials and their manufacture ; (v) prices of the main imported or exported commodities in the international markets ; (vi) indices of prices received and paid by farmers and their ratios ; (vii) indices of cost of production ; (viii) indices of rural and urban wages and wage rates ; and (ix) information regarding changes in the food weight in family expenditure and regarding the elasticities of demand and supply of important crops.

National Commission On Agricultural Price Policy

The National Commission on Agriculture was asked to study the problem of prices in the context of a policy of incentives for agricultural production and in particular to consider (i) ingredients of agricultural price policy ; (ii) what should be the policy for the supply of key inputs and credit at concessional or fixed prices and other non-price measures ; (iii) relative roles of different types of administrative prices for achieving desired increases in production under different trading system ; (iv) what considerations should be taken into account in fixing the prices of individual agricultural commodities ; and (v) the manner in which the existing arrangements for advising the Government in regard to prices of foodgrains and agricultural prices can be strengthened.

The Commission set up a Study Group under the chairmanship of Prof. M. L. Dantwala to report on the above matters. The Group submitted its Interim Report in 1975 and made the following recommendations.

1. Approach to Agricultural Policy

(1) The assurance of remunerative prices to the farmers is a necessary condition for encouraging investment in agriculture and for adoption of modern technology without which agriculture cannot develop. At the same time, the agricultural price policy should be formulated keeping in view its impact on the general price situation and economy as a whole. The policy should be in alignment with the country's overall economic policy and should facilitate growth with stability.

(2) Reliance should not be placed on price as the principal mechanism for augmenting production in a situation where shortages run across the board. Such a policy will only add to price rise without yielding higher production. The increases in output and the farmer's income will have to be brought about mainly through technological improvement and availability of crucial inputs rather than by manipulation of prices. (Paragraphs 3.6 and 3.7)

(3) Since the shortage or near-self-sufficiency in most of the agricultural commodities is likely to continue for the next 10 to 15 years, the price policy should take note of this situation which is often accentuated by speculative hoarding. (Paragraph 3.12).

(4) The major aim of agricultural price policy should be to correct distortions, which are socially or economically harmful and which emerge from time to time because of the imperfections of the market mechanism. Being parts of the same price policy, the interests of the producers should be safeguarded through price support operations, when there is a sharp fall in prices ; and the interests of the consumers, particularly the vulnerable sections of the population should be protected through procurement and distribution of a part of the marketable surplus at below the market price, when there is a sharp rise in prices of basic necessities such as cereals. (Paragraph 3.13).

(5) Public distribution of essential commodities will have to be a permanent or semi-permanent feature of economic management in the country in the context of shortages. In order to ensure the efficient functioning of the public distribution system in respect of cereals, the Department of Food in the Ministry of Agriculture and Irrigation should prepare, in consultation with the Agricultural Prices Commission of the States, a National Food Budget every year after taking a realistic view of the requirements and availability. The targets for internal procurement of cereals should be laid down on the basis of this Budget. (Paragraph 3.15).

(6) The dual pricing and dual availability system in vogue in this country in respect of cereals and sugar should be continued until an overall balance between supply and demand is achieved on a durable basis in respect of these commodities. (Paragraph 3.16)

(7) Considering the limitations of inter-commodity parity approach under Indian conditions, it cannot be made the basis for fixing agricultural prices for all crops ; however, in the case of a few competing crops, like paddy and jute, this can be taken into consideration while fixing support prices. (Paragraph 3-21)

(8) In fixing prices, it is not necessary to seek to achieve parity between domestic and international prices. The right policy would be pooling of prices, when there are imports, in the

interest of both the producers and the consumers. (Paragraph 3.22 and 3.23)

(9) An integrated price policy involving inter-sectoral price-parity, however desirable, is difficult under Indian conditions and should not be made a basis for formulating agricultural price policy. (Paragraph 3.24)

(10) The price fixation should take into account the fluctuations in the prices of inputs. The output prices should generally not be out of alignment, for long, with the package of input prices. (Paragraph 3.25)

(11) Automatic linkages between the prices received by the farmer for his produce and the prices paid by him for the consumer goods commonly used by the farmers will be self-defeating and need not be attempted. However, Index Numbers of Parity between the prices received and the prices paid by the farmers both for domestic and farm expenses should be constructed so that a watch can be kept on the behaviour of the parity and corrective measures taken whenever the parity gets unduly against the farmer. Paragraph 3.26)

(12) As the prices of agricultural commodities are expected to take into account changes in input prices, widespread use of input subsidy as incentive to increase production should, by and large, be avoided, except in the case of small and marginal farmers and difficult areas. In the latter case, a transport subsidy will be in order. However, for promotional effort in specific cases, timebound input subsidy will be justified. (Paragraphs 3.27 to 3.30)

2. Minimum Support Prices

(1) Agricultural price policy must in all circumstances embrace within its core a policy of offering minimum support prices for the principal crops in order to encourage investment and adoption of improved technology. The minimum support price should be fair to the farmer and should cover his cost of production and leave him a reasonable margin of profit. (Paragraphs 4.1 and 4.2)

(2) In the calculation of costs, the family labour should continue to be evaluated on the basis of the wage rate for attached labour. (Paragraph 4.9)

(3) No specific allowance need be made in the cost on managerial account, when it is not actually incurred by keeping hired managers. (Paragraph 4.10)

(4) Since the available data on costs do not provide a firm basis for price fixation, because of wide variation and several other limitations, effort should be made to develop and use an index number system for the principal crops to take into account year to year changes in the costs of production. (Paragraph 4.22)

(5) Till the index number system can be developed, the Agricultural Prices Commission should make an informed judgment about the fair minimum support price, taking into account the available data on the costs of production, and after consulting its Advisory Panels. (Paragraph 4.23)

(6) The existing practice of fixing a uniform all-India minimum support price should continue. However, in specially high cost areas, a differential price may be allowed, the difference being limited to the cost of transport from the nearest area producing the same crop where the uniform price is applicable. The support price should be announced well ahead of the sowing season to facilitate investment decisions by the farmers. (Paragraphs 4.24 and 4.25)

3. Procurement and Distribution System : (a) For Cereals

(1) In a shortage situation, procurement prices of cereals have to be below the prevailing market prices in order to subserve the need of the public distribution system. Since the issue price has to be related to the purchasing capacity of consumers with low income, the procurement prices, although higher than the minimum support prices, cannot be much above the issue prices minus the cost distribution plus, at best a small element of subsidy. (Paragraph 5.4)

(2) The public distribution system should be geared to take care to a greater extent than hitherto, of those whose purchasing capacity is limited or is affected by natural calamities. The system should normally cover (i) all cities and towns with population over one lakh excluding those in surplus areas in surplus States ; (ii) all industrial towns covered under the scheme of All-India Consumer Price Index Numbers for Industrial Workers ; and (iii) drought prone and flood affected areas. The modified rationing system, which is working in the rural and urban areas of Jammu and Kashmir and Kerala, may also have to be continued for some time to come. (Paragraph 5.8)

(3) In order to meet the requirement of the areas and the population through the public distribution system, the guiding principle should be to aim at a procurement of 12 per cent of cereal production on an average by the public authority for the next few years. This may imply a procurement of 12 million tonnes in 1975, comprising 5 million tonnes each of rice and wheat and 2 million tonnes of coarse cereals. (Paragraph 5.12 and 5.13)

(4) The practice of paying wages in kind to the agricultural labourers should be maintained. This will enable these poor workers to meet their food requirement and thereby lessen their hardship. (Paragraph 5.14)

(5) The major operational instrument for procurement of cereals should be the well-tried system of compulsory graded levy on pro-

ducers, millers as well as on hullers. The entire requirement of grain for the public distribution system can be collected through this instrument, if it is adequately supported with legal sanctions and administrative arrangements as well as political backing. The rates of levy in each State should be decided on the basis of its procurement target laid down under the National Food Budget. Such exemptions/relief for the smallest farmers, as may be deemed necessary, could, however, be considered. Due allowance should also be made for differences in output levels between irrigated and unirrigated areas. (Paragraph 5.19)

(6) Other forms of procurement, such as pre-emptive purchases of wheat in heavily surplus areas of Punjab and Haryana and levy on traders for coarse cereals, in areas where their production is dispersed, could be considered, provided that through these methods the procurement targets determined under the National Food Budget are reached by the concerned State. (Paragraphs 5.23 and 5.24)

(7) The system of levy on the producers of commercial crops, who are required to pay it in terms of grain, has much to commend itself. The result of the Maharashtra experiment deserves to be watched. (Paragraph 5.25)

(8) In the event of land revenue being collected in kind, there would be a case for correspondingly reducing the compulsory levy commitment of the farmers. (Paragraph 5.26)

(9) While preparing the National Food Budget, the availability not only of the surplus in surplus States but also of the surplus of the surplus farmers and surplus areas in the deficit States should be taken into consideration. (Paragraph 5.28)

(10) Considering the importance of the relevant statistics, suitable arrangements should be made to collect, as precisely as possible, information about the public distribution of cereals in rural and urban areas separately in order to decide the quantum required for future distribution. (Paragraph 5.29)

(11) If additional quantities of cereals are purchased by the Government from the open market, this should be done without announcement of either the proposed quantum of purchases or the price. Its buying agency, the Food Corporation of India, should develop appropriate communication and market intelligence system so that it can switch purchases to the most advantageous market, thereby developing a good deal of efficiency in the operations. (Paragraphs 5.30 and 5.31)

(12) After the realisation of the levy by a State, the State Government should be given the option to remove restrictions on the movement of foodgrains. However, the question whether the obligations of levy by a State have been fulfilled or not should be decided not by the concerned State, but by the Central Government. (Paragraph 5.32)

(13) In the interest of both the producers and the consumers, the marketing margins allowed in procurement and distribution of cereals should be reviewed and reduced, wherever possible. (Paragraph 5.33)

(14) Buffer-stock of foodgrains being an integral part of the public distribution system, a view should be taken, while preparing the National Food Budget, on the level of stocks to be maintained and the manner in which these should be built up. The location of these stocks should be planned keeping in view the coverage of the public distribution system so as to avoid cross movements and the costs involved therein and the stocks should be released only through the public distribution system. The stocks should be rotated reasonably quickly to reduce deterioration and losses arising out of long storage. (Paragraphs 5.34 and 5.35)

(15) The practice of announcing the procurement price before the harvest should continue. There should not be any mid-season change in the procurement price. (Paragraph 5.36)

(16) While an all-India procurement price is desirable, small extra payments would be permissible in a State, where production rights have suffered relatively more, provided the extra element is kept within limits and its impact on the pooled price of grain issued from the public distribution system is marginal. (Paragraph 5.37)

(17) The procurement agency should gear up its arrangements for purchase of grain from the small farmers early in the marketing season so that they get a proper price for their produce. (Paragraph 5.38)

(b) For Commercial Crops

(18) The considerations in fixing minimum support prices for commercial crops are the same as in the case of food crops. Apart from the major commodities already covered by it, the Agricultural Prices Commission should watch the price trends of other important commercial crops and make its recommendations, in appropriate cases, regarding the minimum support prices and the measures necessary to make them effective. (Paragraph 6.3)

(19) Adequate arrangements should be made by the concerned Corporation for making purchases not only from the established markets but also from interior markets and producing areas as the marketing season for a particular crop starts. This step will help particularly the small growers. (Paragraph 6.4)

(20) When prices tend to be low following a bumper crop, it is necessary for the purchasing agency to make support purchases of surplus production in excess of the immediate demand and build a buffer-stock, which can be used for stabilising prices in lean year and for export. (Paragraph 6.5)

(21) Even in a situation of generally high prices in the established markets, the Corporation and other buying agencies should be in a position to make purchases in specific pockets/areas, where prices are relatively low. (Paragraph 6.6)

(22) In a situation of shortage and high prices, the Corporations, to be effective, should have sufficient turnover of their stocks. The prices, at which the Corporations and other agencies are to buy, should be determined after taking into account their impact on the domestic industry, the economy and exports. The Agricultural Prices Commission should provide necessary guidance to the purchase organisations in this matter. (Paragraphs 6.8 and 6.9)

(23) Adequate arrangements should be made for promotional purchases of new commodities in order to establish the cultivation of these new crops widely. (Paragraph 6.11)

(24) Since the establishment of a separate agency for each crop for price support and other operations will add to overhead costs, the possibility of setting up a single Agricultural Commodity Corporation of India for commodities other than cotton and jute, for which separate corporations have already been established, and tobacco, for which a Board is envisaged, should be considered. (Paragraph 6.12)

4. Arrangements for Advising the Government

(1) The Agricultural Prices Commission should continue as an independent advisory body for technical assessment and opinion and have a complement of four members. An eminent economist should be its Chairman. Its Member Secretary should also be an agricultural economist or statistician experienced in agricultural policy. The third Member should be an agricultural scientist experienced in problems of production. The fourth Member should be a non-official with understanding of agricultural productions and consumer problems. (Paragraphs 7.7 and 7.8)

(2) The arrangements for consultation need strengthening. In addition to the present practice of appointing the Panel of Farmers, another Technical Panel should be appointed with agricultural scientists, agricultural administrators and economists and statisticians. The Panels should meet regularly.

Appendix 1

Index Nos. of wholesale Prices-Relative Prices of Agricultural products and Manufactured Products (Base 1970-71=100)¹

Year	General Index of wholesale prices	Index for Agricultural products	Index for Manufactured products	Prices of agricultural products as % of manufactured products
Average months				
1971-72	105.6	100.4	109.5	109.1
1972-73	115.2	110.3	121.9	110.5
1973-74	139.7	139.2	139.5	100.2

1. (Economic Survey, 1977-78, p. 94)

1974-75	179.9	169.9	168.8	99.3
1975-76	173.0	157.3	171.2	108.8
1976-77	176.6	158.5	175.2	110.5

Appendix 2**Index Nos. of wholesale Prices (1970-71=100)¹**

	Price	Wheat	Pulses	Raw Cotton	Raw Jute	Ground- nuts	Edible Oil
Last week of							
1971-72	105	103	118	83	103	83	86
1972-73	121	110	150	103	120	131	116
1973-74	162	120	199	178	184	159	161
1974-75	189	189	196	137	105	147	155
1975-76	147	153	148	144	131	95	103
1976-77	157	159	171	209	143	173	167
Average of weeks							
1971-72	103	100	111	108	96	88	88
1972-73	116	107	138	92	110	104	99
1973-74	140	108	177	138	99	166	148
1974-75	183	183	216	169	104	173	172
1975-76	179	160	182	136	177	129	135
1976-77	157	152	146	198	127	142	143

Rural Development Programmes

India is a land of villages, in which resides about 80 per cent of its population. There are 575,936 villages in which live 439.1 million people. For untold centuries each Indian village was the whole world for its people. 'The village communities are little republics having nearly everything they want within themselves. They seem to last where nothing else lasts. Dynasty after dynasty tumbles down, revolution succeeds revolution, Hindus, Pathans, Moghuls, Marathas, Sikhs, English are Masters in turn, but the village communities, each one forming a separate State within itself, remain the same. It has contributed more than any other cause to the preservation of the people of India, "through all revolutions and changes they have suffered."¹ However, such communities suffered from isolation and had no facilities of the modern times. Centuries of village living has developed viewpoints, beliefs, attitudes and practices that have become an integral part of their very being.

General Characteristics of Rural People

1. The rural attitude is fatalistic. Through centuries man has done nothing to control the forces of nature, hence, he never can. What is, is meant to be, and cannot be changed.
2. Very few cultivators regard agriculture as a commercial enterprise. They see it only as subsistence farming. For thousands of years the primitive methods of cultivation handed down from father to son have stood the test of time in producing a scanty but certain minimum food. Hence, any suggestion for a change in methods is regarded as an unwarranted gamble.
3. For generations villagers have lived with little or on knowledge of outside world, in almost complete spatial and mental isolation. Knowing only their own customs and practices they look with strong misgivings at innovations or suggestions for change. They possess an innate resistance in change.
4. Rural people are suspicious of all strangers. In their experience outsiders have usually exploited country people. Representatives of government have frequently come to collect an onerous tax. Private buyers from outside have cheated cultivators by paying them too little for the meagre produce they had to sell.
5. Fear of ridicule is inborn in villager. Even though he

1. *Report of the Select Committee of the House of Commons, 1832.*

may be inwardly convinced that a new method would be useful in increasing his yield, he fears to employ it lest it fails and subjects him to the ridicule of his neighbours for having departed from traditional ways.

6. New methods frequently require additional investment for new seeds, pesticides, fertilizers or improved implements and irrigation. The fear of losing his scanty capital decides many farmers to play safe with old methods.

7. Villagers are strongly family centred. Any decision to break with tradition and employ a new method must usually be a family rather than an individual decision. In many cases it must be a group decision involving several families.

These conditions were till recently found in many far-off isolated villages. With the development of modern means of transport and industrialisation the villages lost their self-sufficiency and were brought into the vortex of commercial competition and world market. The indifferent attitude both of the urban people and the government brought these villages to the lowest level of destitution, appalling poverty and indebtedness. All this set both the people and the state to think hard as to how to bring about the rehabilitation of the villages.

During the first quarter of the present century it was realised that if the poverty of India's teeming millions is to be relieved, more attention had to be given to rural areas where most of the people lived. The interest was further created with the publication of the Royal Commission Report on Agriculture which stated: "If inertia of the centuries is to be overcome, it is essential that all the resources at the disposal of the State should be brought to bear on the problem of rural uplift—which required steps to be taken to remove illiteracy, poverty, ignorance, dirt, disease and general apathy—and sustained effort should be made by all those departments whose activities touch the lives and surroundings of the rural population."¹

Recent Changes in Rural India

On account of growth of the span; spatial scatter and the complexities of the development activities, as also significant changes in the strategies, the context of constitutional building in rural India has undergone a change since submission of the Report of Balvantray Mehta Study Team in 1957.

Among the striking changes in rural India the most important have been (a) imparting of dynamism to agriculture which was previously stagnant (b) the enlargement of the concept of agriculture to cover allied occupations like dairy, piggery, fishery, social forestry etc which are of special relevance for the economy of the

2. *Report of the Royal Commission on Agriculture, 1928.*

weaker sections (c) assured availability, on an increasing scale, of new agricultural technology including scientific utilization of major and minor irrigations (d) emerging shifts in national policies towards cottage, village and rural industries at localized production points (e) increasing possibilities for absorption of institutional credit for effective implementation of productive projects (f) growing importance of marketing, involving a series of extra local transactions (g) the emergence of growth centres and need for tackling the rural-urban continuum (h) increasing emphasis on group action and conjoint activities (i) growing concentrations on special efforts to organize and assist the weaker farmers in particular and poorer sections of society in general and finally (j) coupled with developmental urges, the evolving needs for provision of the welfare and municipal utilities requiring in the rural areas, different ~~type~~ of technical servicing functions.

Aims and Aspects of Rural Reconstruction Work

Rural reconstruction aims at using all of the good things in the Indian village life, so that the people are helped to develop into a glorious institution for more abundant living. Broadly speaking, rural reconstruction programme has a three-fold aspect, viz., material, intellectual and moral.

(i) Materially it seeks to improve the health and raise the standard of living of the agriculturists. The former is achieved by encouraging better sanitation and by the provision of medical aid. To realise the latter, better methods of cultivation, finance, and marketing are popularised.

(ii) As regards the mental or intellectual aspect, educational facilities are provided for the boys, girls and adults, Information and instruction are also made available through the radio, film shows, lectures and demonstrations by touring parties to the adults.

(iii) The moral aspect, however, is the most fundamental. It seeks to awaken the will of the villager, to make him conscious of the value of his personality and individuality. It aims at creating in him the desire for self-improvement and self-discipline by individual and collective action so that he may be freed of the inhibitions that are obstructing the way of his self-realisation. It seeks to release his pent up energies for removing defeatism, superstition, baseless fears created by centuries of depression and oppression.

In a word, the rural reconstruction movement seeks to change the villagers' entire outlook on life.

PRE-INDEPENDENT EARLY ATTEMPTS AT RURAL RECONSTRUCTION

Sriniketan Experiment

To the twenties of this century belong the experiment at Sriniketan, Martandum and Gurgaon. Inspired by a profound humanism,

Rabindranath Tagore's experiments at Sriniketan was aimed at both the economic as well as the moral rehabilitation of the rural community. The co-operative village health societies were starting programmatic innovations. The chief obstacles to the villagers were monkeys, malaria and mutual distrust, resulting in poverty, indebtedness and fear of constant oppression by one or the other group. Therefore, efforts were made first to eradicate the first two menaces. Later on, village crafts were introduced, new breeds of poultry and cows, new vegetables and new manures and implements were then introduced. Boarding schools for boys and girls were established where village children came by week. These schools also gave training to the boys and girls in dormitory, kitchen-garden, poultry-run and dairy, games and sports, carpentry and other crafts. Villagers were demonstrated the utility of these in home, in garden and the village.

Notable results were achieved in a small area and in a few villages. Economic returns were such that the rising standard of living in the area was noticeable. New confidence arose among these villagers. They felt able to tackle new things to defeat pessimism and to achieve results together. But many difficulties arose. The professional guidance was not available from anywhere, the basic research had not been done, and pilot experiments in the application of results had not been carried out. More trained persons were essential but they were not available at the meagre salaries offered to them. *Secondly*, the government machinery tended to work on a mechanical routine with much from filing. The idea that local government should take a share in rural development and show some responsibility for rural welfare was a new one and not generally accepted in secretariates. So many of the rural problems uncovered needed understanding from officials who had little or no experience.

Tagore's ideas and influence inspired and penetrated every corner of Sriniketan. He constantly urged that "our practical achievements, our clean milk, our fresh eggs, our flourishing co-operatives, were all useful means, but still only means towards the achievement of much greater end." He urged to draw upon all resources, in music, song, drama and dance, at Santiniketan, so as to enrich lives, to liven aspirations, to inspire leisure, and to increase delight in every kind of artistic expression, until the cultivators could produce a richness and a wealth of cultural life, and a rejuvenation of those ancient art forms that still survived, but so tenuously in village around.

Martandam Project

Rural reconstruction programme was initiated by Spencer Hatch at Martandam (south Travancore) in 1921. It was densely populated and was the market place for the 40 surrounding villages within a radius of 3 miles. The people were very poor, the land pretty well worn out. There were very few cottage or spare-time industries,

their quality being poor. Wages were low, water was a constant problem, debt was prevalent with very high rates of interest (as high as 300%). Therefore, the whole economic set-up needed study and betterment. Martandum rural reconstruction centre was, therefore, opened with a five-sided programme, developed under the emblem of: "The 5-Sided Triangle," comprising Spirit, Mind, Body, Economic and Social side.

The philosophy of rural reconstruction embraced principles (which were simple and easy) known as *Pillars of Policy*. These principles were:

1. *The programme of rural reconstruction was peoples' own.* The personnel were only to help them achieve the programmes.
2. *Help the people to help themselves upwards on all sides of life.*
3. *People of all communities were to be included.*
4. *It is the poor who require help more and, therefore, reach the poorest.*
5. *Maintain a comprehensive programme,* and as such attention was devoted to the development of poultry-keeping, bee-keeping, and other cottage industries like mats and basket making, palmyra sugar, hand-woven cloth, etc.
6. *Spirituality should be the basis of every programme.*
7. *Keep simplicity the key-note* because unless the whole rural reconstruction movement remained simple it would cost too much and perforce would stop short of benefits to millions of rural people.
8. *Honorary unpaid service help make an efficient and highly productive extension service.*
9. *Close co-operation between the rural people and the government officials is a must.*
10. *Emphasis was laid on training of workers.*

This Centre worked on the philosophy of "Self-help" with intimate expert counsel. It maintained exhibits of well bred bulls, chicken and goats, model bee hives, red-cross health charts, samples of cottage industries and on its few acres of land demonstration plots of improved crops. From head-quarters experts were sent to the people in their own villages and homes but the responsibility for carrying out improvement activities was clearly delegated to the people themselves. The work in the villages was largely carried on through "Clubs." These clubs may be Egg selling clubs, Honey clubs, Bull clubs, Weavers' clubs or other according to the activity. They have been very successful. Through them villagers were taught to produce and sell canned cashew-nut, pure clean jaggery, peanuts, vegetables, baskets, mats, fancy umbrellas, pickles, Christmas cards and many other products.

To meet the physical, mental and spiritual needs of the people social activities were initiated in health centres, libraries, boy-scouts and girl guides, and in sports clubs. Special emphasis was placed on folk-dances and folk-singing. Co-operation in work, in play and in all activities of life was successfully emphasised. In fact, this centre has succeeded in changing the psychology of the people. In the words of Miss Ouwerkerk : "It has evoked in them enthusiasm, a desire to improve, a spirit of co-operation and a new self-respect. This new spirit among the people makes it possible to work out a comprehensive programme of rural reconstruction."¹

The Gurgaon Experiment

The credit of starting village uplift movement goes to Shri F. L. Brayne, who was posted as Dy. Commissioner of Gurgaon district in 1920. He was appalled at the uncertainty of rain fall and consequent abject poverty, dirt, ill-health and misery of the rural people, with no conscious desire for anything better, because they had no idea that anything better was possible. He, therefore, evolved a new technique of village development called the "*Gurgaon Scheme*." This was, in other words, the practical application of the principle that the central figure, viz., the villager himself, must be made to take greater interest in himself and in his village before any results can be achieved ; and the government agencies should do more to combine and co-ordinate their activities in order to assist, help and guide him. *The Gurgaon scheme claimed to deal with the whole life and the activity of the peasant and his family and to present a complete remedy from the terrible conditions in which he lived.*

According to Mr. Brayne, "Our object in Gurgaon has been to jerk the villager out of his old groove, convince him that improvement is possible, and kill his fatalism by demonstrating that both climate, disease and pests can be successfully fought. He must be laughed out of his uneconomic and unhealthy customs, and taught better ways of living and farming. Further the secrets of our success were to deal with the whole of village life, to take the whole district as the field of operations and to deluge the areas with every form of propaganda and publicity that we could devise or adopt or afford. Uplift is a mass movement, a combined assault, and no area, no part of the life and no method of attack can be neglected."

The development work was taken up under the Gurgaon scheme under these sub-heads :

(a) *Institutional Work* comprising the setting up of (i) *School of Rural Economy*² to train village guides for the rural uplift

1. Ouwerkerk, *Developing Village India*, 1951, p. 39.

2. The school managed a farm of 51 acres on long lease for the purpose of providing practical training to the students. The curriculum of the studies included scouting, co-operation, practical agriculture, first aid, infant welfare, public health, domestic hygiene and sanitation, village hygiene and sanitation, stock breeding and elementary veterinary training. The students were expected to qualify in the examination in first-aid and co-operation and special test in all the other subjects. Those who qualified in this test were appointed as village guides.

work;¹ (ii) a *Domestic School of Economics* to uplift village women;² (iii) *Health Association* to promote public health ; and (iv) *Women Institute* to manage the ladies' garden in Gurgaon and also to organise games, lectures, and magic lantern shows for the women and first-aid classes

(b) *Rural Sanitation Work* with a view to improve living conditions in the villages by using manure pits as latrines, and by preserving sweepings, rubbish and dung in properly dug pits ; by taking to vaccination against small-pox, by inoculation against plague, killing rats and by well cleaning and proper arrangements for drawing water against cholera and by using quinine and mosquito nets to prevent malaria.

(c) *Agricultural Development Programme*, under which farmers were exhorted to set up model farms, use improved seeds, adopt Gurgaon plough and other improved implements ; use preventive measure against crop pests, killing of field rats and monkeys, and drawing other harmful insects by keeping lanterns in the fields. Consolidation of land holdings was to be taken up on co-operative basis,

(d) *Education for Scouting and Development of Co-education*. Great importance was given to the village school teacher. According to Brayne, "the village school teacher with his school library, his night school and his scouts must be the centre of uplift and culture and he must be so trained that he can solve all the simple problems of the villager, whether they are agricultural, social or moral or relate to public health."

(e) *Co-operation Was Regarded as the Cement in the Building of Development* which held everything together and made it doubly effective.

(f) *Social Reforms Were Aimed at to Achieve* : (i) Prohibition of child marriages ; (ii) education of girls in the mixed schools ; (iii) Abolition of *purdah* ; (iv) curtailment of ceremonial expenditure ; (v) introduction of marriage registers by which litigation in family disputes is very much lessened ; (vi) propaganda against injurious litigation, and (vii) combating indebtedness.

(g) *Co-ordination and Publicity were Made the Responsibility of the Uplift Workers*.

1. The village guides were entrusted with these duties:—(i) development of co-operation, (ii) public health work, collecting list for, preparing people for vaccinators visit; (iii) cleaning of villages by digging of manure pits, putting in of windows, ventilators etc. in the house; (iv) agriculture demonstration and sale of improved ploughs and other implements, improved seed, persian wheel, etc.

2. The curriculum of studies in the domestic school included reading and writing up to primary standard, in the case of illiterate women, and some instructions in sewing, knitting out and making clothes, embroidery work, toy making, cooking, hygiene, sanitation, first aid and child welfare etc.

The Gurgaon scheme may be described as a judicious combination of the villagers' own efforts with the activities of the nation building departments. It marked a definite departure in the technique of village improvement and attracted India's wide attention. Its chief value undoubtedly was that it awakened the people and the government to the vital problem of village reconstruction as an immediate necessity.

Sir M. Darling commented "Pits were dug in thousands. Hissar bulls and Gurgaon plough bought in thousands and Persian wheels put up in scores. Villages were cleaned, and recleaned, multitudes attended the annual Palwal fair, large sums were raised for high schools, and many girls went to school with boys. Activity was unprecedented, and a few who took part in it could resist its contagion... But unfortunately after seven months all is changed, and the optimistic estimate is that among the peasants themselves not more than one-third of the activity remains."¹

Brayne himself realised that the scheme looked grand but it was not to last or take roots "Good work, excellent work is going on all over the Punjab. You can travel all day and find nothing that offends either eye or nose. Village after village and zail after zail have been turned into models of new life. Marvellous changes have been made and there is a feeling of life and movement in the air. Have we found the incentive then? Will this work last and spread? Alas, no! This work is not being done by villagers determined to live a better life but by villagers determined to please their District Officers. A good enough motive in its way but not the motive we are looking for. There is no permanence about this kind of work. What if the District Officer's attention is diverted elsewhere, or he wants something different done, or in a different series of villages?"

All the same, it cannot be denied that the scheme made greatest contribution to the cause of rural reconstruction in India.

Rural Reconstruction Movement In Baroda

The first rural reconstruction centre was set up in 1932 and the work commenced in a group of villages round Kosamba (in Navsari district). The basic idea underlying can be seen from the following extract :

"The single outstanding fact in the agricultural economy of India is that owing to seasonal and other conditions, work on the land is possible only during a portion of the year. Millions of people are, thus, unemployed over periods of the year ranging from two to three months in the highly irrigated areas to as much as eight to nine months in the dry tracts. This long interval of enforced idleness and dreary waiting between crop and crop leads to evil, economic and

7. M.L. Darling, *Rusticus Loquitor*, pp. 121-26.

moral, which it is unnecessary to describe to those who know village life in India—the squalor and rivalries, and factions and the litigation which has been described as “our second greatest industry.” No lasting improvement can be achieved in the conditions of rural life unless all sides of it are attacked at the same time ; the many sides of it are all so closely interconnected.”

The Centre aimed at : (i) effecting an improvement in all aspects of rural life *i.e.*, changing the outlook of the agriculturists, the problem being “the development of the desire for a higher standard of living”; (ii) to undertake intensive work to realise this aim ; (iii) to develop best type of village leadership ; and to undertake the following programmes :

(A) **Economic Programme** consisted of : (i) development of subsidiary occupations like kitchen-gardening, weaving, poultry farming, sericulture, bee keeping etc. (ii) farm improvements in cotton and other crops ; (iii) co-operative society to inculcate thrift ; and (iv) the village panchayats to provide for sanitation, village roads and drinking water supply.

(B) **Education and Moral Programmes** included adult education ; development of community sense and of a feeling of solidarity in the village ; propaganda against evil like early marriages and unreasonable customs connected with social observances ; the proper use of village libraries ; the scout movement and other educative work through lantern lectures ; in short, making village life full and interesting. The village school should be the centre of all such activities.”

The programme of rural reconstruction was to be part of a wider programme for bringing about a rapid increase in standard of living. Increased agricultural production lay at the root of all development. Therefore, the programme was progressively expanded to cover measures such as provision of irrigation facilities ; conservation of soil ; production of nucleus seeds ; their multiplication and distribution ; education in agriculture and supplementary occupations.

From the commencement it was recognised that efforts to increase agricultural production could not succeed unless they were supplemented by programmes for ensuring to villages minimum amenities needed by them. Before the rural reconstruction movement was started, a survey was made of the requirements of villages in the state for minimum amenities and a programme was prepared for (i) feeder roads connecting villages with the nearest railway station or main roads (ii) village wells for supplying wholesome water could not be tapped by digging ordinary wells. There was also provision for the extension of village sites in congested areas. Funds were allotted on a ‘grant-in-aid’ basis. As a general rule, half the cost was provided by the villages in the form of money and/or labour except in backward areas.

The following points were regarded as the basic ones in the programme. *Firstly*, there should be a comprehensive programme of improvements carefully organised for improving all aspects of rural life. *Secondly*, increased agricultural production holds the key to the success of the movement. Programmes for this purpose to cover all areas should be worked out from year to year and there should be an efficient organisation for supplies and services and credit. *Thirdly*, the block team should work unitedly and with a single aim and its activities co-ordinated. The best non-official leadership should be enlisted for the programme. *Fourthly*, the agency in the village through which to assist every family should be the panchayat and co-operative, the village school and library should be the centre for most activities.

In Baroda state there were no village level workers as there were panchayats and schools in all villages and cooperatives in most of them and the 'block' team could establish contact with all families through these institutions.

The Baroda experiment was a great success. This was due to a number of factors. There every village had a panchayat. There were also taluka and district boards. Compulsory education for boys and girls began as early as 1893. The administrative and technical services were organised on the pattern of advanced provinces. More than any thing else, non-officials and officials always worked closely together and the people are enterprising and hard working. These initial advantages were a determining factor in the form in which the movement was developed and the success achieved in its working.

Sarvodaya Scheme of Bombay

Gandhiji wrote in the *Harijan* in 1942 : "My idea of village *swaraj* is that it is a complete republic, independent of its neighbours for its own vital wants, and yet inter-dependent for many others in which dependence is a necessity. Thus, every village's first concern will be to grow its own food crops and cotton for its cloth. It should have a reserve for its cattle, recreation and play-ground for adults and children... The village will maintain a village theatre, school and public hall. It will have its own water works ensuring clean water supply. This can be done through controlled wells or tanks..... As far as possible every activity will be conducted on the co-operative basis.....The government of the village will be conducted by the Panchayat.... Here there is perfect democracy based upon individual freedom."

This scheme is largely based on Gandhiji's idea of *Sarvodaya*. Gandhiji was appalled by the ignorance, disease and poverty of rural people and dreamt of village reconstruction that would fire the imagination of village people and lead them through self-help to insure ample food for all, adequate health protection and medical

services, free education, local-self government, self-employment through cottage industries—in short to make the village life so rich and full and happy that village youth would not be tempted to migrate to big congested cities.

Accordingly, a very intensive scheme for rural reconstruction was launched by the then Bombay Government with a view to promoting the furtherance of Gandhiji's constructive programme. *The underlying idea of this scheme was to inculcate in the villagers the spirit of self-help and mutual-help.* The primary responsibility for rural reconstruction rested on the *Sanchalak*. The work was generally concentrated in compact areas where either the bulk of the people belonged to backward classes or where the rural economy was of a backward type.

Firka Development Scheme of Madras

The Firka Development Scheme aimed at the attainment of the Gandhian ideal of 'Village Swaraj' by bringing about not only the educational, economic, sanitary and other improvements of villages, but also by revitalising the spirit of the people and making them self-confident and self-reliant. The object of the scheme was to attack the rural problem as a whole as well as in its several parts. The scheme consisted of definite short-term as well as long term plans. *The short-term plan* was for the development of rural communications and rural water supply, formation of panchayats, organisation of co-operatives covering every village, implementing a programme of sanitation, etc. *The long-term plan* was designed to further the attainment of self-sufficiency through agricultural, irrigational and live-stock improvements and development of khadi and cottage industries.

The selection of the *firkas* was based on consideration of general backwardness of the firka in regard to communications, sanitation, lighting, water supply, etc. presence of electric installations in or within easy reach of the firka or centre, and the availability of conditions favourable for intensifying the production of handloom cloth for the development of other cottage industries:

The F.D. Programme was first launched in 34 *firkas* throughout the State in 1946 and later extended to 50 additional *firkas* (from 1st April 1950) and to 24 additional *firkas* (in April 1952). Under the scheme, an attempt was made to encourage local leadership and to instal into them the philosophy of self-help. Works under the Scheme were generally carried out only where the villagers were prepared to contribute towards their cost. Emphasis was laid on the execution of works by the villagers benefited by the works to the exclusion of profit earning outside agencies.

The scheme was started for undertaking experiments in intensive rural reconstruction and improving the economic and sanitary condi

tions of the villages. Rural water supply and health improvement had first priority with better communications and improved agricultural practices following closely. The schemes involved close co-ordination of the various Government services of agriculture, veterinary, irrigation, industries, medical and public health and communication departments. The programme was directed in each firka by a Firka Development Committee. A Firka Development officer was appointed, selected from social workers in the country who had distinguished themselves by their zeal for social work.

The Scheme was later merged with the National Extension Services, when this programme was launched in 1953-54.

Evaluation of Early Attempts

It may be noted that nearly all early attempts at village uplift were characterised by initial enthusiasm, the attainment of many desirable objectives, followed by a period of declining activity and usually ending in abandonment of the scheme. This failure has been due to the following factors :¹

1. The attempts were mostly based on individual initiative inspired by humanitarian considerations.
2. Government backing and financial support was not forthcoming in sufficient measure.
3. The attempts were mostly isolated, uneven and discontinuous.
4. The staff employed was inadequate, inexperienced, untrained and hurriedly selected, ignorant of local conditions who could hardly command any respect or influence in the village.
5. The objectives were ill-defined, or lopsided in their development. Little attempt was made to study the peculiar conditions of the villages and to adapt the programme to its need.
6. Plans, programmes and organisations were lacking, weak or unbalanced.
7. Parallel programmes of supplies, services, guidance and supervision were not developed.
8. The need for proper methods and skills of approach to the task was not fully realised.

1. *Information Bulletin*, No. 6, 1959, Department of Agriculture, Mysore Government.

9. Research and evaluation was lacking.
10. Association and co-ordination with other development departments was very limited.
11. The involvement of village people in thinking, planning and executing village development was not properly achieved.

The experiences of the different schemes have been nicely summed up by the Planning Commission in the *First Plan* thus :

“(i) All the departments of the Central Government, *viz.*, the Co-operative, Agriculture, Forest and Revenue approached the villagers from their own aspect of work and as such could not leave a permanent impression on them of the social importance of the multifarious schemes. (ii) Various programmes depended too much on the government financing which were quite inadequate. (iii) Theoretical advice needed to be supplemented by practical aids and demonstrations which were lacking. (iv) Various programmes were forced on the villagers and as such there was no enthusiasm amongst them. (v) The programmes lacked intensive action. (vi) There was no definite, inspiring and attractive goal for villagers which could draw their spirits to work for the improvement in their standard of living. (vii) There was a lack of initiative from the people which is very essential for the success of the scheme. (viii) The experience of the villagers should be respected and should not be prejudicially discarded.”¹

POST-INDEPENDENCE SCHEMES OF RURAL RECONSTRUCTION

The Pilot Development Project, Etawah

“What the Rochdale experiment in England is to the world's cooperative movement, what the Tennessee Valley Authority is to the integrated exploitation of the world's great watersheds, this the Etawah Project has fast become the movement for revitalizing the ways of life of the world's peasantry.”

“Begun under sponsorship of the provincial government of Uttar Pradesh in late 1948 with a unit of sixty-four villages, the project of Etawah grew in three years to include over three hundred villages at the same district, was reproduced at four other centres in Uttar Pradesh, and finally became a prototype for Community Development Projects and National Extension Service blocks in thousands of villages in every part of India. . . . The Pilot Project at Etawah has become to the world a symbol of successful rural development initiated by an enlightened popular government and carried

1. *First Five Year Plan*, pp. 223-4

through without compulsion among a peasantry known for its conservatism."¹

The distinguishing features of the Pilot Projects, Etawah, lay in : (a) attempting a synthesis of the various view-points into a more comprehensive and more coherent picture of rural development based on the combined efforts of the people, government, voluntary workers and others concerned ; (b) in adopting a trial and experiment approach to find out "what would work and what wouldn't and why," and (c) in actually testing out, on a small scale in a small area, the numerous ideas, programmes, organizational and administrative patterns, and techniques of development with a view to selecting for reproduction on large scale application in other areas of such of them as proved to be sound and suitable.

Objectives. The central aims of the Project were :

- (1) To see what degree of productive and social improvement as well as of initiative, self-confidence, and co-operation, can be achieved in the villages of a district not the beneficiary of any set of special circumstances and resources, such as hydro-electric development or large-scale industry.
- (2) To ascertain how quickly those results may be obtainable, consistent with their becoming permanently part of the people's mental, spiritual and technical equipment and outlook after the special pressure is lifted.
- (3) To see whether these results, if attainable, could be had at a cost in material and personnel which would be within the reach of the State by the existing departments and agencies.

1. McKim Marriott and Richard L. Park, Preface to "Pilot Project India," page xii. Please also see among others, the following :

- (i) *Report of the United Nations Mission on Community Organisation & Development in South & South-East Asia, 1952-53*, p. 103 ;
- (ii) *Report of the United Nations Evaluation Mission on Community Development in India 1958-59*, paragraphs 30-32.
- (iii) U. L. Goswamy and S. C. Roy in "Approaches to Community Development, 1953," *A symposium Introductory to Problems & Methods of Village Welfare in Under-developed Areas*, pp. 311-313. The Pilot Project, Etawah, has been designed as a "suitable prototype of the Community Project" or as the "basic model" for India.
- (iv) Dr. Sampurnanand, Chief Minister, U. P. said in a Foreword to "Pilot Development Project, Etawah", p. 1, particularly the following : "Etawah was the school where we the Government, the people and the officers on whom lies the ultimate responsibility for seeing that the decisions taken by the Government are implemented—learned our first lessons in planning" and "The pattern which they evolved has found wide acceptance not only in this State but elsewhere also."
- (v) The Indo-U. S. Technical Co-operation Agreement of 1952 published in "Important Letters Issued by Community Project Administration," p. 12, paragraph 2, Press Note dated 5th January, 1952.

Principles. The basic principles that guided the approach and methods of work in the Pilot Project are :

- (i) Emphasis on self-help ; (ii) simultaneous improvement on the physical and human planes i. e., "to improve the land by improving the people and to improve the people by improving the land ; (iii) democratic approach and people's participation, i. e., voluntary participation and decision-making by the local people in the choice of the programmes, planning and execution should be the key-notes, persuasion and motivation being the tools in the hand of the Project workers, who should work, not for or on the people but with and through them. (iv) results achieved should be repeatable under normal circumstances in other areas. (v) The local people felt needs and the available local resources should form the basis of the programme. (vi) The approach should be integrated and comprehensive and a number of interrelated programmes and problems should be tackled simultaneously. (vii) The programme should start with simple to more complex, closely timed, accelerating and broadening from year to year.¹ (viii) The first and focal activity in economic² i. e. agricultural. This is the 'economic key' that opens the door to a broad vista of numerous programmes and possibilities (ix) Systematic planning and precise targets in terms of amounts or quantities of work, persons, areas, and units of time are indispensable "as progress indices, as giving backbone and substance to work, however lofty and far-flung our objective." The process emphasizes and facilitates "concentration, systematic step-by-step performance, self-measurement and self-correction." (x) One of the important techniques adopted in the Pilot Project, Etawah, has been "to build mutual confidence between the village and government workers as its servants." The Project, set out with the object "Our own attitudes as government workers are most crucial; we must work with the people, not tell them ; we must demonstrate by doing with our own hands in their own villages and fields—in short, "dirty-hands" methods, not "armchair" methods." (xi) Whatever item is successfully initiated must be maintained and followed up to its logical conclusion with a view to keeping it alive, useful and actually in use. (xii) Piecemeal and sporadic efforts aiming at creating show-pieces or "Nine-day wonders" by means of artificial props and short-cuts should be scrupulously avoided. (xiii) There should be a co-ordination between extension and services and supplies.

1. Albert Meyer and Associates, *Op. Cit.*, p. 131.

2. *Ibid.*, p. 38

Programmes. The specific programme of work consisted of increasing agricultural production through the introduction of improved varieties of seeds, chemical fertilizers, green manuring, compost-making, improved implements, irrigation, plant protection measures, horticultural development, soil conservation, improved cultural practices, etc.; improvement of animal husbandry, through up-grading of cattle, disease control and management; provision of co-operative services for credit, production, marketing and supply; better-sanitation and health services, control and eradication of human epidemics; provision of maternity and child welfare services; improvement of roads, water-supply, drainage and other public utility works; improvement of housing; and, last but not the least, a broad-based social education programme by means of adult literacy classes, study tours, half-field demonstrations, provision of reading-room and library service, one-act plays, competitions, farmers fairs, work with rural institutions and organisations, village leaders' training camps and mass contact programmes. The economic programme, with agriculture as the spear head, was the pivot and all other programmes were correlated, as far as possible, to it.

Evaluation of the Pilot Project. Significant results were achieved in numerous fields. For example, the total agricultural production went up by at least 50 per cent, and yields were high. Bunding, terracing, gullyplugging, strip and mixed cropping, counter ploughing, growing of erosion-resistant crops and grasses became common in the area. The success of the programme changed the farmer viewpoint *vis-a-vis* nature and its noninevitability and possible control by men and by himself in co-operation with his neighbours. Improved implements were introduced. Co-operative brick kilns, manufacture of agricultural implements, sericulture and canning and fruit preservation industries came into existence as a part of the Project work. Adult social education classes in the villages, provision of community centres and youth programmes (i. e., learning by doing, learning while working and making a profitable use of leisure) made considerable headway.

Another "distinguishing feature of the arrangements was that there was to be an integrated scheme in which the technical workers functioned as part of the over-all village team, with a feeling of deep interest and participation, so as to invoke and retain the confidence of the village community."¹ A new element of team relationship has been introduced in the old departmental pattern of working in water-tight compartments.

Another significant new element of the administrative pattern was the process of "inner democratization, by virtue of which the highest officer habitually invites and arranges for the experience and advice of all those below him, and the lowest worker feels free

1. G. B. Pant, Foreword, *Pilot Project, India*, p. viii.

to give it frankly and without fear. The breaking of this up-down water-tight compartment releases energies and initiative and effectiveness of planning and performance at all levels."

The essence of the Pilot Project approach was to try out an idea or programme on a small-scale, with rigorous definition of objectives, content of the programme, targets and methods in advance, thoroughness and concentration during the testing out period, and of the past in the post-trial period. Adequate study, planning, proper timing, preparation, selection of the right methods, with maximum emphasis on the speed and efficiency but without over-eagerness to achieve physical results anyhow, were some of the essential characteristics of this approach.

Spectacular as the results of the Pilot Project have been, it will be an illusion to imagine that it was all smooth sailing and there were not set-backs, mistakes, failures and frustrations. Far from it, there have been too many of them and some of them lingered on. The programmes of village replanning, co-operative farming and, to a great extent, rural industry and women's welfare, were not fully established yet programme of soil conservation, popularization of improved agricultural implements and environmental sanitation passed through long periods of difficulties, doubts, and vicissitudes before finally making a headway. Even the most successful programmes, such as, green manuring and other items of increasing agricultural production or co-operative brick kilns had their birth pangs and teething troubles. As a matter of fact, hardly anything worth achieving was achieved over night or without difficulties.

The Nilokheri Experiment

To rehabilitate the displaced persons, coming from Pakistan in the wake of partition, and provide them with gainful occupation, a new township was first developed at Nilokheri in 1948 with the efforts of Shri S. K. Dey. This township in course of time, "hummed with the music of muscles." Shri Dey evolved a faith that "muscles can do it." "Muscles can be trained to do it," and "Conditions can be created to do it." The triple tenets of faith were to activate and support a triple charter of rights; "Right to Live," "Right to work for a living," and "Right to receive what is earned." To give a practical shape to this charter of rights, a new scheme *Mazdoor Manzil* was drawn up. It was designed not only to rehabilitate the displaced persons but as something even bigger as a Road to New India.

The basic concept of *Mazdoor Manzil* was to stop the one-way traffic of labour, material, skill, and culture from villages to the town. To stop this harmful one-way traffic, a decentralised administration and a decentralised economy was necessary. This would lead to an agro-industrial economy. *Mazdoor Manzil* visualised a nucleus town-

ship with a population of about 5,000. The township was intended to include institutions for medical relief and sanitation, middle and high school education ; technical and vocational training : veterinary aid, and agricultural extension embracing agriculture, horticulture, poultry, piggery, fishery, sheep breeding and other forms of animal husbandry. There would also be an electric sub-station, arts and crafts centre, shopping and marketing centres. The township would, moreover, provide recreational facilities through libraries, reading-rooms, cinema, drama, music and other cultural activities.

By the beginning of 1950, the activities of the township had been fairly streamlined. The polytechnic and vocational centres, work centres for all crafts were started at Nilokheri. Thus came into existence an engineering workshop, a mechanised wood working shop and a printing press. Weaving, calico printing, soap making, laundering, tinsmithy, blacksmithy, general mechanics, leather tannery and a multitude of other crafts and trades began to flourish. Besides farming on a fairly extensive scale, a dairy, a piggery, a poultry farm and a horticulture section were set up. A naturopathy health centre was established.

Co-operatives were also started to look after the problems of marketing. Farm land in the colony was entrusted to individual farmers at the rate of 6 acres per head. Bullocks, implements and capital was also provided to them. Panchayats were revitalised.

In a way Nilokheri has been the pioneer in the development of industrial estates. The extension services provided in the township were forerunners of what followed under the Community Development programme later on. The significance of the Nilokheri experiment was summed up by Shri Nehru in these words, "All over India we have centres of human activity which are like lamps spreading their light more and more in the surrounding darkness. Among these centres there is Nilokheri which has achieved a good deal of fame in India and outsideI want ten thousand Nilokheries spread over the country."

Under Rural Development Programmes of the government, the following need be mentioned :

1. Small Farmers Development Agency/Marginal Farmers and Agricultural Labourers Projects.
2. Hill Area Development Projects.
3. Whole Village Development Programme.
4. Integrated Rural Development Programme.

1. Small Farmers Development Agency/Marginal Farmers and Agricultural Labourers Projects.

During the Fourth Five Year Plan 46 SFDA and 41 MFAL projects were started as pilot experiments designed to improve the economic condition of the weaker sections and generate greater employment particularly through fuller self-employment of the participant farmers in the rural areas. They seek to tackle the problems of small and marginal farmers through special agencies set up for the purpose.

It is estimated that by the end of Fourth Plan, approximately 5 lakhs of small and marginal farmers would have been covered by production investment programmes and about 20 lakhs initiated to intensive agriculture, in the 87 projects. Since most of the SFDA/MFAL projects started functioning effectively only in 1971-72, the 5 year project period has been computed from that year and existing projects were continued in the first two years of the Fifth Plan. In view of the recommendations of the National Commission on Agriculture for reorientation of these schemes, some changes have been effected in the programme contents. During the Fifth Plan period all the SFDA/MFAL projects were made 'composite' projects covering small and marginal and agricultural labourers; and their number increased to 160 including the on-going projects which were allowed further extension of life for 3 years (i.e., 1978-79).

Under the programme, at least 10,000 farmers are proposed to be benefited in each district through various activities such as sheep, cattle, dairy, crop husbandry, wells, small tube-wells, sericulture, horticulture development, etc. Till December 1977, 13.65 lakh farmers have been benefited. Employment generated has been estimated at 127 lakh mandays, in major sectors like soil and water conservation, irrigation and afforestation.

During the Fifth Plan the parameters for identification of small and marginal farmers have been fixed as 5 acres of dry land for small farmers and 2.5 acres of dry land in the case of marginal farmers. The main emphasis is on crop husbandry, which includes intensive agriculture multiple cropping, introduction of high yielding varieties, horticulture, land shaping, development of irrigation, etc. with emphasis on adoption of dry farming practices and water harvesting measures in rainfed areas.

During 1977-78, the Agencies identified 8.20 lakhs small and marginal farmers and agricultural labourers and brought 3.75 lakhs of them in the cooperative fold.

2. Hill Area Development Projects

In the field of hill area development, some special development projects were taken up in the earlier Plan periods under the Indo-German Assistance Programme. These Projects were located in

Mandi and Kangra districts of Himachal Pradesh, Almora district of Uttar Pradesh and Nilgiris district of Tamilnadu. Encouraged by the success achieved in these projects two Central sector projects for integrated agricultural development in hill areas were sanctioned entirely from domestic resources during the Fourth Plan period which are continuing during the Fifth Plan. These projects are located at (1) Pauri Garhwal (U. P.) and (2) Manipur West district. A third HAD project has been set up in Tehri Garhwal.

These Projects aim at an integrated development of agriculture, horticulture, animal husbandry, dairy as well as development of infrastructural facilities in the spheres of minor irrigation, soil conservation, drainage, processing and marketing facilities. Both these projects are administered through Agencies registered under the Societies' Registration Act of 1860.

A sum of Rs. 210 lakhs had been allotted for these Projects for Fifth Plan period. During the year 77-78, a sum of Rs. 70 lakhs has been provided in the budget. A total amount of Rs. 172.3 lakhs has been released to the two Projects since their inception. Against this amount, the Projects have incurred an expenditure of about Rs. 152.7 lakhs for implementing the various development programmes. Encouraging results have been achieved in these Projects with regard to agricultural demonstrations, multiple cropping and introduction of high-yielding varieties. Other programmes like soil-conservation, land development, minor irrigation, etc. have also been included in the programme.

3. Whole Village Development Programme

The National Commission on Agriculture made recommendations for improvement and modernisation of Indian agriculture with a view to promote the welfare of the people. Recognising the urgency of increasing the productive capabilities in the rural areas and promoting the welfare and prosperity of the people through equitable distribution of the benefits of development, the Commission has recommended the 'Whole Village Development Programme' to be implemented in the Fifth Five Year Plan period. Through this scheme, the Commission has tried to explore the possibility of adopting a whole village approach to development for harnessing the growth potential of the village. The programme contents are : (1) Consolidation of holdings; (2) Over-all land development plan or maximising water control and moisture preservation in dry areas; (3) Maximising irrigation support subject to per acre maximum limit of investment based on the need to repay investment credit by extra production possible; (4) Cropping programme for the village for best use of irrigation and for ensuring best control of irrigation and drainage.

The central theme of the 'Whole Village Development Programme' is a concentration of entire multi-facet development

endeavour around the village community as a whole. *The core idea is to achieve social objective by reducing the disparities in income among the ruralities and increasing employment opportunities.* The programme also lays stress on non-agricultural sectors in addition to saturating the agricultural sector so that the benefits would flow to all sections in the village. Recognising, however, that agriculture itself has ample scope to develop, the emphasis is on agricultural development. It is intended that when once surplus is generated and the entire village participates in this development, the development of the non-agricultural sectors catering to the local supply needs and consumption requirements will be easier.

In the first instance, the scheme was implemented in four States viz., Bihar, Orissa, Tamil Nadu and Uttar Pradesh on a pilot basis covering 38 villages in all. With this end in view, four projects one in each of these States were selected. After gaining sufficient experience in the working of this programme under different soil and climatic conditions, with the ultimate objective of developing certain models, was extended gradually in other parts of the country wherever feasibility to implement it exists. The outlay provided for the programme for 1976-77 was of the order of Rs. 10 lakhs, and for 1977-78, Rs. 50 lakhs. About Rs. 8.23 lakhs have been spent by March, 1977.

4. Integrated Rural Development Programme

The Integrated Rural Development programme envisages the development of the rural areas and people belonging to the weaker sections such as the small and marginal farmers, tenants and share croppers, landless labourers, rural artisans, members of the scheduled castes and tribal communities who suffer from economic and social handicaps; removing poverty and unemployment; and developing potentials of local resources to satisfy local needs and bring about environmental balance.

Genesis of the Programme. The lessons of the working of Community Development Programmes have been the cornerstone for the evolution of the Integrated Rural Development Programme (IRDP). The C. D. P. movement failed for various reasons and these gave serious thinking for the evolution of a new programme for the integrated development of the areas and the people of the weaker sections. The main drawbacks have been :

(a) The inability of the C. D. model to recognise, much less reconcile and resolve the inherent conflicts in the inter and intra-target groups, i.e., the big and the small farmer, landowners and the landless, the bureaucrats and the peasants, the city elite and the mass of rural poor contributed in a large measure to the failure of C. D.

(b) The lack of mass participation (which was the basis of the movement), excessive bureaucratisation, central planning and the

eventual strengthening of the existing social order in the village further were some of the proximate causes of the failure.

(c) The response of the government to create local institutions, e.g., the panchayats to democratise and decentralise decision making in an effort to move centres of decision nearer to the rural people, to encourage their involvement and check the bureaucratic control, did not succeed.

(d) Without dismantling the power structure in the village, the devolution of authority under democratic decentralisation, superimposed in a social system which was highly skewed in the distribution of economic, social and political power, consolidated the unofficial position of dominance of vested interests over the dominated further and harder. These interests appropriated whatever additional power was developed to the rural areas among themselves. The result was the complete drying up of whatever motivation or total mobilization of effort was there in the majority of rural masses.

Therefore, it was felt that if rural development is to be brought about, it needs a new model wherein the various intra and inter-group conflicts within the rural society are given a sharper recognition and reconciliation. However, it need be noted that IRDP and C. D. are both based on integrated development of all sectors and sections of rural population as distinct from narrow sectoral programmes like high yielding variety programme, minor irrigation and other such schemes. Secondly, both encompasses different sections of the rural society and realise the significance of human help and mobilization.

Objectives of the Programme. The IRDP was initiated during 1976-77, with the selection of 20 districts, representing all the typical socio-economic and ecological zones of the country, with a view to bring about development of these districts and use the experience gained country-wide. As originally conceived the programme consisted of two phases, viz., (i) preparation of resources, inventory, malady remedy analysis and action plans for the selected districts, and (ii) implementation of the programme.

Since the preparation of the resource inventory and action plan was a time-consuming process, and the government felt that the old concept of IRDP was not in conformity with the national objectives of growth and full employment in a certain time-frame, hence, the IRDP has been restructured. This new Programme is based upon three clearly defined objectives :

- (i) growth and production,
- (ii) benefits to the identified target groups in the 'disadvantaged sections' of the rural community, and
- (iii) full employment with a certain time frame.

Thus, the new approach aims at integrating field programmes reflecting the economic activity of the rural family whose employment and development is the basic objective. This is to be brought about by developing the primary, secondary and the tertiary sectors. In the *primary sector programmes for agriculture*, animal husbandry, fisheries and forestry development will be intensified. In the *secondary sector programmes*, for villages and cottage industries, skill formation and supporting services will be developed. *Tertiary sector* will be developed by creating facilities for organised marketing, processing and allied activities so as to absorb increasing number of local people.

It will be noted that the strategy for the programme is generation of additional income and employment opportunities for the "rural poor" through optimum use of local resources-human, biological and natural-through positive inputs of available appropriate technology. The programme contents mainly are ; development and intensification of agriculture, including horticulture, animal husbandry, and dairy farming, poultry, piggy, fisheries, sericulture, farm and social forestry; medium and minor irrigation; land development; soil and water conservation; setting up of agro-based, forest-based and village and cottage industries; taking up of meaningful programmes for rural artisans and encouraging self-employment schemes.

Active involvement of the people for whom the programme is meant in all its stages, from formulation to implementation is the essential feature of the strategy.

The Target Groups. The target groups, for the programme, comprise small and marginal farmers, tenants and share croppers, landless labourers, and rural artisans. Members of the scheduled castes and tribal communities are also in the target group as they suffer from economic and social handicaps.

Approaches to Rural Development. Different approaches to rural development and area development have been attempted by the government. These included the resource-based or problem-based development approach, the target-group approach, the incentive approach and the comprehensive area approach.

Resource or problem based area programmes emphasise on the development of the 'area' subject to weaker sections being enabled to take full part therein. This includes the Drought Prone Area Programme, the Command Area Development Programme and the Hill Area Development Programme.

Target group or Beneficiary oriented programmes, emphasis on the development of weaker sections. Such programmes include SFDA/MFAL programmes, and the Tribal Area Development Agency Projects.

Area Specific Incentive programmes emphasise on the provision of concessional finance, investment subsidy and transport subsidy schemes.

Comprehensive Area Development programmes, deal with sub-plans for hill and tribal areas.

Under the Integrated Rural Development Programme, the purpose is to bring the main elements of SFDA/MFAL Programmes to bear on each of the areas covered by any of these programmes depending on the suitability of the programmes.

Working of the Programme. There are about 5100 N.E.S. Blocks in the country in about 390 districts. Of these, about half blocks would be covered through intensive area planning under IRDP. Presently 2946 Blocks are covered under the three programmes, viz., SFD Agency, D.P.A.P. and C.A.D. From April 1, 1978, 2000 Blocks, from the Blocks covered under these three programmes, have been selected. Besides, there are 59 districts which are not covered under any of these three programmes. One Block in each of these districts will now be selected for IRDP. The selection of the Blocks will be done on the basis of intensity of unemployment and poverty, priority being given to areas identified as "hard core of backward areas in the country."

At present 16 districts have been covered under the IRDP, viz., Chandrapur, Wardha, Tumkur, Cannanore, Mirzapur, Tehri-Garhwal, Kutch, Hoshiarpur, Hissar, Mehboobnagar, Karrup, Dharampuri, Kangra and Rohtas.

Essentials of Success for the Programme. If the IRDP is to be a success, it is necessary that the inter and intra-group conflicts are first to be identified, and the programme geared towards the people, their potentialities and motivation. The Programme should build into its method the concept of flexibility (i.e., no uniformity should be imposed on a situation which is heterogeneous and essentially diverse); comprehensiveness (i.e. the programmes and schemes should be located and identified by the villagers themselves); geographical and sectoral integration, i.e. there should be spatial and sectoral linkages with the resource endowment of the concerned area), widest discussion by the groups and sub-groups of the rural areas, and participatory process in the development by a more massive than ever mobilisation and participation by rural masses. The target groups should be enabled to exercise protection to their own industries from competition from urban based industrial products wherever they consider necessary. The cadre of educated unemployment could be built to take up responsibility. Only then would the I.R.D.P. prove worth its salt.

Criteria for Success of Rural Development Programme

The true test of the success of such a programme is that it should survive, grow, spread and become permanent. In other

words, it should be characterised by self-sustaining, self-generating self-perpetuating growth.

It will be worthwhile to spell out, at some length, the criteria for judging the success of a project of this type :

(1) There should be a cumulative growth with an ever-rising tempo in each successful field. In other words, an upward trend should be maintained till the particular programme reaches the saturation point by achieving the end set out for it.

(2) In addition, the level of interest, skill and information on the part of the people should develop to such an extent that they would seek new practices, methods and programmes on their own and the field services and supplies should be so strengthened as to cope with the new demands.

(3) The programme should have a broad impact and the inter-related elements and aspects should mutually support and sustain each other. In other words, there should be simultaneous progress on a number of fronts in an organically correlated manner.

(4) Success in the simpler programmes should pave the way for more difficult and complicated programmes of bigger dimensions.

(5) Local people should shoulder more and more responsibility and demonstrate their acceptance of the programme by their keenness to maintain the programme and to pay for it.

(6) Last, but not the least, the programme should have a high survival value.

Community Development Programme

Evolution of C. D. Programme

Several experiments in rural reconstruction undertaken by official and non-official agencies in the past proved the beneficial effects of intensive area projects in which activities in various fields of development were closely integrated. This fact was recognised by the Planning Commission in their Draft Outline of the First Plan in 1951. The Indo-U.S. Technical Co-operation Agreement (January, 1952.) enabled a beginning to be made in this direction. The Grow More Food Enquiry Committee, 1952, had also recommended an organisation for intensive rural work which would reach every farmer and assist in the co-ordinated development of rural life as a whole, similar in conception to the Extension or Advisory Service in U.S.A., U.K. and elsewhere. Accordingly, the *First Five Year Plan* declared a policy in these terms : "Community Development is a *method* and National Extension is the *agency* through which the Five Year Plan seeks to *initiate* a process of transformation of the social and economic life of the villagers."¹

The origin and development of C. D. Projects was based on the recognition of the following facts :

1. That 80 per cent of the population of India lives in villages; that their life is one of abject poverty utterly lacking in social amenities enjoyed by the working classes in many nations ; that their outlook on life is apathetic and the hope of spontaneous leadership for improvement is almost nil.
2. That most villagers are partly unemployed for months of the year and if this immeasurable manpower could be creatively employed in building facilities demanded by a satisfactory scale of living, village life could be revolutionised.
3. That any attempt to bring improvement of upgrading in village life by governmental edict or command would fail.
4. That with sympathetic counselling, expert guidance and limited financial assistance villagers can be led to recognise their most

1. *The First Five Year Plan*, 1951.

immediate and acute problems, to think about them, formulate plans for their solution and put these plans in action. Self-help is the key stone of village development.

5. That success with the first improvement develops individual pride and group satisfaction and leads desire for further improvement ; that over a term of years, successive improvements in agricultural production, in a clean water supply and health measures, in village industries, in education for both children and adults and in cultural and recreational opportunities can completely transform village life, not only in physical amenities and improved economic status, but in the mental attitude and behaviour pattern of the villagers. Hopelessness can be replaced with determination, apathy with ambition and indifference with pride in accomplishment.

Therefore, under the Plan it was decided to bring about a co-ordinated, a many-sided development in the rural areas, by creating initiative and teaching the villagers the importance of organised co-operative efforts on the principle of making provision for their mental and physical development.

Concept of Community Development

Community development has been defined as "a movement designed to promote better living for the whole community with the active participation and on the initiative of the community."¹

According to the Report of the U.N.O., "the term C. D. has come to connote the process by which the efforts of the people themselves are united with those of governmental authorities to improve the economic, social and cultural conditions of communities, to integrate these communities into the life of the nation, and to enable them to contribute fully to national progress."² Obviously, the C. D. programme is directed to the task of rural upliftment. C. D. embraces all aspects of government activity in the field—the improvement of agriculture, the combating of soil erosion, the development of water supplies, the promotion of co-operation and better marketing, livestock and forestry development, education, health clubs and community activities, and provision of technical assistance, etc. and people's contribution in the form of labour, management and locally available materials, etc.

Essentially, the C. D. was looked upon as an integrated approach to local development as a part of the bigger scheme of planned national development. As a process it involved a sequential and interdependent progression of changes—economic, social, political and psychological. It was tended to assume the character of a movement because the programmes it signified emanated from an egalitarian ideology. C. D. has been recognised as "a balanced programme for stimulating the local potential for growth in every

1. Cambridge summer Conference on African Administration, 1948.

2. U. Nations, *Community Development and Economic Development*, p. 1.

direction. Its promise is of reciprocal advance in both wealth and welfare, not on the basis of outside charity but by building on the latent vitality of the beneficiaries themselves with the minimum of outside help. "In fact, C. D. Projects are *experiments* to establish a system of agricultural in a land of impoverished soil and a more democratic structure in a hierarchical society."¹

Objectives of Community Development Programme

The aim of the programme is to secure the fullest development of the material and human resources of the area, and thereby raise the rural community to higher levels of living. "A rapid expansion in food and other agricultural production has been prescribed as the primary objectives of the Programme. Allied to this objective is that of the development of cottage and smallscale industries for the purpose of providing employment to the non-agricultural classes. Emphasis is laid on the improvement of health, sanitation, provision of housing facilities, promotion of educational and other social welfare activities, development of communication facilities, rural employment, welfare of women and children, has also been laid down as one of the objectives of the programme. Furthermore, considerable stress has been placed on the importance of training agriculturists, artisans and extension workers of various kinds for the proper implementation of the programme. The programme is also required to bring about a change in the mental outlook of the people, by instilling in them an ambition for higher standards of living. The need for "rural-cum-urban" development has also been emphasised.

Shri V. T. Krishnamachari, while reviewing the objectives of the community development programme and the national extension service programme, touched the following points :—

- (1) Leading rural population from chronic under-development to full employment.
- (2) Leading rural population from chronic agricultural under-production to full production of scientific knowledge.
- (3) The largest possible extension of the principles of co-operation by making rural families credit-worthy.
- (4) Increased community efforts for the benefit of the community as a whole, such as village roads, tanks, wells, schools, community centres, children's parks, etc.

Mr. Hammarskjöld in U. N. Report on C. D. P. in India wrote that "the aim of community development project and national extension service is not merely to provide ample food, clothing and shelter, health and sanitation, facilities in villages. More important than the immediate material improvement is the change in outlook

1. U. N. Report of C. D. Evaluation Mission In India : Programme of Technical Assistance, 1959.

of the people instilling in them an ambition for a richer and fuller life and developing the capacities of the individual so that he can master matters for himself."

The community development programme may be regarded as a device to augment resources and to utilise them for the benefit of the rural masses largely in terms of their preferences. The Draft Five Year Plan says, "the basic objective of the C.D.P. is to secure the fullest development of the material and human resources on an area basis and thereby raise the rural community to higher levels of living with the active participation and of the initiative of the people themselves."

Thus, the ideal of C. D. is to create the Welfare State where people and the government could work in co-operation to promote the objective of *the greatest well-being of the greatest number*. This programme has been undertaken for initiating a process of transformation in the socio-economic life of the villagers to begin with and to work as an engine of economic growth at a later state : for energizing and mobilizing the available manpower resources in the country so that the semi-stagnant Indian rural economy could be rejuvenated and revitalised. This objective is to be achieved through : (i) extermination of the triple enemies of rural India, viz., *poverty, disease, and ignorance* : (ii) removing mountain of inertia, and infusing spirit of brotherliness and co-operation ; (iii) seeking self-help and self-reliance : and (iv) throwing sufficient scientific knowledge at the very doors of the distant man in the distant village.

The Essence of The Programme

The change in rural life has been thought of to be brought about by concerted efforts and an integrated approach making an assault on all facets of rural life through a single multi-purpose agency, viz., C. D. Projects. The programme vividly recognises :

(a) *Triple Tenets of Faith*. (1) muscles can do it : (2) muscles can be trained to do it ; and (3) conditions can be created to do it.

(b) *Triple Character of Rights*. (1) right to live : (2) right to earn ; and (3) right to receive what is earned.

(c) *Triple Rules of Business*. (1) elevation : (2) integration ; and (3) standardization.

Thus, *the central theme of C.D. Programme is to change the rural men from tradition to modernity and to make him worthy of his existence.*

Shri S. K. Dey observed "A community is distinguished in our society by the same features as we distinguish an orchard from a jungle. The jungle contains all types of vegetables but it is

1. *Draft Five Year Plan, 1974-79, Vol. II, p. 85.*

unplanned and in its combination of varieties is determined solely by the varieties of soil and weather. An orchard is a planned and ordered jungle and each plant develops on the principle of live and let live. A community of people will have to be guided by the same basic principles and the master artist will have to apply his tools in the same pattern." At a different place he wrote, "Resources—human and natural as they stand—are adequate for the simultaneous laying of the nurseries so the seedlings from the nurseries can be planned to take, due course, their place left vacant on the orchard sites. The men and materials are already there, what is needed essentially is the breaking of the vicious circle, 'this cannot be done.'"

Contents of the Programme

The main lines of activity undertaken in the programme are : agriculture and related matters : irrigation, communications, education, health, supplementary employment, housing, training and social welfare of women and children and cottage and small scale industries.

(1) The extension activities of the community development organisation consist of the *development of agricultural production*, for which each development block has a body of village level workers and a team of technical specialists in agriculture, animal husbandry, co-operation and rural industries. The main elements in this programme at the village level are :

(i) full utilisation of irrigation facilities, repairs and maintenance of community irrigation works, field channels and economy in the use of water ; (ii) increase in the area under multiple cropping ; (iii) multiplication of improved seeds and its distribution to all cultivators in the village ; (iv) supply of fertilizers ; (v) programme for compost and green manures ; (vi) adoption of improved agricultural practices such as soil conservation, contour bunding, dry farming, drainage, land reclamation, plant protection ; (vii) programme for new minor works to be undertaken in the village, and for the introduction of improved agricultural implements. (viii) programmes for the production of vegetables and fruits, development of poultry, fish and dairy products ; (ix) maintenance of stud bulls and castration of scrub bulls ; and (x) development of the village fuel plantations and pastures.

Since agriculture is the mainstay of as many as 70 percent of rural population, its development received the highest priority in the programme.

(2) *Formation of new co-operative societies* and strengthening of existing societies in order to bring every family in the area under the influence of the movement.

(3) (a) *Encouragement of employment* through planned distribution, trade, auxiliary and welfare services, wherever possible on a cooperative basis. (b) *Encouragement of cottage, medium and small scale industries.*

(4) *Provision of roads, encouragement of mechanical road transport services and development of animal transport.*

(5) *Provision for compulsory and free education* at the elementary stage, high and middle schools, social education and library services.

(6) *Provision of sanitation and public health measures, nutritious diet, medical aid* for the ailing, pre-natal and ante-natal care and midwifery services.

(7) *Provision of refresher courses for improving the standard of existing artisans* and arrange for the training of agriculturists, extension assistants, supervisors, artisans, managerial personnel, health workers and executive officers for the projects.

(8) *Provision of improved techniques and designs for rural housing and housing in urban areas.*

(9) *Provision of community entertainment* by utilising talent and culture, audio-visual aids for instruction and recreation and to organise local and other sports melas, co-operative and self-help movement.

In brief, the chief features of the programme are :

(i) to assist each village in planning and carrying out integrated multi-purpose family and developmental plans towards increasing agricultural production, improving the existing village crafts and industries and organising new ones, providing minimum essential services and improved health practices, providing required educational facilities for children, providing recreational facilities and programmes for rural women and children.

(ii) Application of the principles of self-reliance and co-operational on an extensive scale for which a variety of institutions have been set up.

(iii) Harnessing rural man-power for which such programmes as *shramdun*, etc., have been devised. It would, thus, be observed that the programme is not concerned solely with activities in economic field but also lays emphasis on improvement of all phases of rural living—drinking water, housing, sanitation, schools, communications, social education, youth and women's organisations, recreational activities and cultural revivals. According to Dr. Carl C. Taylor "*C. D. is technically aided and locally organized self-help.*"

In addition to the manifold development of rural India, the Central Government has laid down special emphasis on the develop-

ment programme in tribal areas. The pattern of development in these areas is more or less the same as in the rest of the country, the only difference is in its application in a degree of stress. Their programmes include schemes for the building of roads, the improvement of water supply, the provision of irrigation, the development of agriculture, animal husbandry and cottage industries and for increased education and medical facilities. The main problem in these areas is the improvement of agriculture because the people of these areas practise shifting cultivation. People in these areas are always ready for co-operative endeavour and they hold that crops are the result of the community as a whole. This co-operative feeling has facilitated the implementation of Government schemes.

ORGANISATION AND ADMINISTRATIVE SET-UP

The organisation and administration of the programme at various levels is carried out thus :

At the Centre. Under the Ministry of Agriculture and Irrigation the Department of Rural Development is now in overall charge of the programme. For the successful implementation of the programme at the top there is a Central Committee consisting of the members of the Planning Commission and the Ministry of Agriculture and Irrigation. The Central Committee formulates the policies and provides general supervision. This Committee is also responsible for developing the programme of economic development. Co-ordination with the allied Ministries is secured through special committees. Actual work of direction and co-ordination is carried out by the Development Commissioner in charge of C. D. P. in every state.

At the state level the actual execution of the programme is the responsibility of the State Governments. As such, below the central organisation, there is a state organisation which is organised more or less on the same lines as the Central Committee. Development Commissioner or official of the same cadre acts as the secretary to this committee. The State Development Commissioner is the administrative head assisted by a technical advisory committee and a team of experts.

At the district level the statutory zila parishads are responsible for the implementation of the programme in the districts. He is assisted in carrying out the programme by Block Development Officers.

At the block level, the panchayat samiti is in charge of the programme. The membership of the samiti includes elected sarpanchs (presidents of the village panchayats) and a few co-opted persons representing women and depressed and scheduled classes. The administrative personnel consisting of a Block Development Officer and eight extension officers who are experts in agriculture, co-operation, animal husbandry, etc., work under the direction of

the samiti. Voluntary associate organisations like the youth clubs, farmers' forum, mahila mandals supplement the work of the panchayat in their respective functional spheres.

At the village level there are village level workers or the *gram sewaks* and *gram sevikas* who act as multipurpose men and women and are in charge of multipurpose extension work in about 10 villages. The panchayat is in overall control of the programme and is helped by associate organisation.

Along with the official set-up non-official participation has also been emphasised at every stage. This programme is often called a people's programme. There is great stress on the people's participation not merely in the execution of the programme but also in the planning. In securing the participation of the villagers, it avails of the service of all non-official local organisations.

Located as far as possible in the neighbourhood of river valley projects, the Community Projects were initially divided into two main types : (a) *The Basic Type Rural Community Development Projects*, each of which consisted of 300 villages with a population of 200,000 in which the primary emphasis was placed on raising agricultural production with some work on public health and sanitation, education and road building. (b) *Composite Type Community Development Projects* in which the emphasis was laid on development of small industries as well as agricultural production and also on extending existing urban amenities to the rural areas. The Plan also visualised the construction of new townships, with the object of creating an integrated rural-cum-urban community.

Under the Programme, the unit of operation is the development block which represents on an average 100 villages with a population of about 100,000 persons spread over an area of 150 to 170 square miles. This programme has three broad features :

1. The Village Unit
2. Mandi Unit and
3. Development Block.

1. *A Village Unit*, on the average, consists of 100 families or 500 persons. Each village has two wells, or tanks for drinking water, adequate drainage facilities, agricultural extension service at the rate of one agricultural extension officer for every 5 villages, veterinary services, sanitary inspector maintained at the Block centres arrangements to serve at least half of the agricultural land with irrigation and to keep one-third of the areas of the village reserved for housing grazing land and freshly planted, if not already existing, fuel, forests, road facilities to link every village within the projects area up to a maximum distance of half a mile from the village, the latter being connected by feeder roads, through voluntary labour, schools for primary education of all school-going children and primary adult

education and recreation centres in the open air, and centres for fisheries.

2. *A Mandi or Market Unit*, consisting of 25 village units, includes a middle or secondary school, a small mobile service dispensary, agricultural extension service, sub-headquarters, a post and telegraph office, a transport service centre ; marketing centre with godown centres : an arts, crafts and cottage industries centre ; a model farm with a garden and breeding service centre ; an open air dispensary for peripatetic veterinary service. For the present, due to financial considerations the *Mandi Units* have been omitted.

3. *The Development Blocks* consist of 4 to 5 mandis or market centres for about 100 villages. The headquarters of this block are a kind of rural-cum-urban township of 1,000 families with an approximate population of 5,000. This Block is scheduled to have all the amenities now available in urban areas *i. e.*, residential accommodation for 1,000 families including latrines, baths, waterways, electricity, a shopping centre, industries covering arts, crafts and cottage, small and medium scale industries, a post, telegraph and telephone office, a transport service, schools, a primary health unit consisting of 15 beds equipped for mobile works in the village, administrative offices and police stations, a nursery, a veterinary hospital and social education and community activity centre.

Urban-Cum-Rural Township or a Taluq Centre consists of 300 villages with three Development Blocks with a population of 5 thousand. Each one of those townships has a basic teachers' training college, a technical training centre, arbitration and law courts, a factor service and supply station, a transport workshop, an engineering workshop, secondary hospital equipped with all accessories for all types of medical aid, a training centre for village level workers, a dairy, a poultry and agricultural experimental station including soil research laboratories. But finance difficulties have compelled government to leave the schemes of such townships. In its place a mandi centre under the basic rural project has been provided at the headquarters of the Block.

Implementation of the Programme

The Programme was launched on October 2, 1952 with 55 pilot projects on an experimental basis. The programme was implemented in units of blocks, each comprising generally 100 villages with an area of 400 to 500 sq. kms. and a population of 60 to 70 thousand. It was felt, in the beginning, that the scheme should be extended to all the villages as early as possible. But the Programme (which required a budget allotment of Rs. 15 lakhs for each block) could not be extended to the entire countryside for want of resources. To meet the demand of the villages for the extension of resources, a less intensive scheme called *National Extension Service* was created from October 2, 1963. Shri V. T. Krishnamachary said. "They are based on the same ideas. Their methods and aims are identical. The

only differences are, *firstly*, that a higher standard of development is attempted in the community development areas by allotting them larger funds ; and *secondly*, the C.D.P. are temporary for three years while the National Extension Organisation is permanent.” In both the programmes, the work of agricultural extension was a common factor but in C. D. it was more comprehensive. Thus, a development block which has received attention under the extension programme could subsequently be selected for intensive development under the C. D. Programme. Ultimately each development block which passed through the intensive stage reverts to post-intensive stage.

The funds provided for the C.D. were staged between the three phases of the programme, enabling the first phase under the N.E.S. to serve as a pre-basic programme, preparing the ground through a relatively slow process of extension, for the more intensive activity to follow during the second phase of the programme and the ultimate transition into the third phase, *viz.*, post-intensive phase in which people and their institutions will have greater share of responsibility in keeping up the tempo of work ; the objective being to bring about a stage of development at which the change-over from “Government’s Programme with People’s Participation” to “People’s Programme with Government Participation” was possible.

Initially, a community development block covered an area of about 1,300 sq. km. with about 300 villages and a population of about 2 lakhs. The pattern was changed from 1st April 1958. A block now covers an area of about 400-500 sq. kms. with 100 villages and a population of about 1 lakh. A block has two stages of operation, stage I of five years followed by stage II of another five years. At the end of 10 years, the block enters post-stage II phase. The system of this classification has been adopted by all the states except Andhra Pradesh which classified them as backward, ordinary and advanced blocks and Karnataka, which has abandoned the classification and accepted *taluka* as a C. D. unit replacing the block. Lakshadweep has 5 blocks categorised as special blocks.

On April 2, 1977, out of 5,028 blocks, stage-wise classification is available, for only 4177 blocks. Of these 20 blocks were in Stage I, 155 in Stage II and 4,324 in post stage II phase. Among these blocks there were 493 tribal development blocks of which 43 were set up during the Second Plan, and the rest during the Third Plan subsequently.

The table below gives details of the coverage and state-wise distribution of C. D. block :

-
1. V. T. Krishnamachary, *Community Development in India*, p. 38.

Coverage and State-wise Distribution of Community Development Blocks as on 2-4-1977

States/U.Ts.	Total No. of delimited blocks	No. of Blocks allotted		Population covered by col. 6 (in lakhs) (1971 Census)	Village covered by col. 6 (00 No.) (1971 Census)	Area covered by col. 6 (in 00 sq. kms.)
		Stage I	Stage II	Post Stage II		
1. Andhra Pradesh	324*	—	—	—	296	2,749
2. Assam	130@	—	—	130	234	996
3. Bihar	587	—	—	587	782	1,739
4. Gujarat	218	—	2	216	189	1,870
5. Haryana	87	—	87	87	71	436
6. Himachal Pradesh	69	—	—	69	190	448
7. J&K	73	—	—	73	68	1,233
8. Karnataka	175**	—	—	—	298	1,920
9. Kerala	144	—	—	114	16	387
10. Madhya Pradesh	457	—	10	447	771	4,431
11. Maharashtra	343	—	—	308	389	3,066
12. Manipur	14	—	—	14	20	223
13. Meghalaya	24	—	—	24	50	224
14. Nagaland	21	—	4	17	10	165
15. Orissa	314	—	—	314	517	1,558
16. Panjab	116	—	—	117	130	617
17. Rajasthan	232	—	—	232	359	3,423
18. Tamil Nadu	374	—	—	374	171	1,302
19. Tripura	17	—	—	17	52	105
20. Uttar Pradesh	876	—	—	876	1,149	2,936

21. West Bengal	325@	—	101	234	358	416	874
<i>Union Territories</i>							
22. A & N Islands	5	—	—	5	1.2	4	83
23. Arunachal Pradesh	43	2	2	41	4.5	30	814
24. Chandigarh	1	—	1	—	0.2	0.3	—
25. D & N Haveli	2	—	—	2	0.7	1	5
26. Delhi	5	—	—	5	4.2	3	15
27. Goa, Daman & Diu	12	—	—	12	8.0	4	37
28. Lakshadweep	5	—	—	—	0.3	0.2	N.A.
29. Mizoram	20	20	—	—	N.A.	N.A.	N.A.
30. Pondicherry	4	—	—	4	4.5	4	5
All India	5028	20	155	4,349	4,697	6,325	31,661

*Andhra Pradesh has introduced a new classification (Backward, ordinary and advance blocks) dispensing with Stage-wise classification.

**Karnataka has abolished the Stage-wise classification of blocks w.e.f. 1-4-69.

@ Stage-wise classification as on 2-4-1976.

Report of the Department of Rural Development for 1977-78, pp. 82-83.

Resources of the Programme

Resources for the programme are drawn both from the people and the Government. For each project area, programme prescribes a qualifying scale of voluntary contribution from the people in the form of money as well as labour. Where the state offers material assistance for the execution of these projects, the expenses are to be shared by the State and Central Government, the proportion being 1:3 in the case of non-recurring items. However, the recurring expenses are shared equally between them. For productive works like irrigation, reclamation of land, necessary funds are advanced by the Central Government to the State Government in the shape of loans. From April 1, 1969, the State Governments are free to provide resources for the programme from within their State Plan ceiling according to the priority accorded to the programme by them. Now the Central Government's assistance to the States is given as annual lump sum grants as Block grants and Block loans.

The expenditure on community development in the first three Five Year Plans was Rs. 501 crores. From 1967-68 to 1973-74, it was Rs. 172.38 crores. The Fifth Plan outlay for community development is Rs. 161 crores. An outlay of Rs. 28.54 crores for 1977-78 has been approved.

Peoples' contribution till 1972-73 totalled Rs. 167 crores.

For motivating farmers to maximise production, community development and panchayat raj agencies give top priority to agriculture and allied programmes. These include formulation and implementation of field programmes for the development of horticulture, animal husbandry, distribution of improved seeds, fertilizers, pesticides, construction and maintenance of minor irrigation works, bunding and popularisation of improved agricultural techniques and implements and organisation of agricultural demonstrations.

The average distribution per block during 1976-77 was 1665 quintals of seeds, 12,749 quintals of fertilizers, 187 quintals of pesticides and 8272 implements. 7.5 lakh hectares of cultivated land were improved through bunding and terracing and 2.7 lakh hectares of land reclaimed.

To create awareness and responsiveness among the village people about the need to have a small family, planning receives high priority in the block programmes. A total of 5276 primary health centres were in existence and 5168 family planning centres were functioning in rural centres besides 37690 sub-centres set up under the health and family planning programmes.

The number of adult literacy centres was 21,000 imparting literacy to about 3.8 lakh adults.

Evaluation of the C. D. Programme

Commenting on the Programme, Prof. Toynbee described it as "one of the most beneficent revolutions in the peasantry's life

that have been known, so far, to the history." The U. N. technical Mission headed by Shri M. J. Coldwel praised the programme as "one of the major experiments of the twentieth century, the results of which are of world-wide interest, and which represents an effort of unprecedented magnitude to establish a progressive system of agriculture in a land of impoverished soil and a more democratic social structure in a hierarchical society." Shri Nehru stressing the importance of the programme said. "The C. D. Projects are the bright, vital and the dynamic sparks all over India from which radiate rays of energy, hope and enthusiasm." Shri S. K. Dey described the Projects as a 'pilgrimage'. According to Shri Lal-bahadur Shastri. "It is massive effort for regeneration of millions of human being."

The general benefits claimed for the Programme may be set forth as below :

- (1) An organisation in the form of community development blocks has come to exist through which it has become possible for the government to reach the rural population and almost all aspects of rural life.
- (2) An administrative set up has been established which is particularly trained for and assigned to the work of economic development and welfare activities in the rural areas ;
- (3) Training facilities have been organised to train administration at various levels to man this programme.
- (4) Institutions have been established to allow for peoples' participation in the operation of this programme.
- (5) The programme has created opportunities for technicians and elected representatives to work together.
- (6) By putting together hundreds of villages in each block, it has become possible to break to some extent the age-old isolation of villages.

As a result of these changes, progress is visible in three directions, viz.,

One, That there now exists an institutional framework for development of villages.

Two, multi-dimensional approach to the problems of development and welfare has been promoted.

Three, hostility towards tradition-ridden attitudes has increased and pro-production values have been furthered.

A Critical Review of the working of Programme

The success or otherwise of the C. D. Programme in India has provoked extreme opinions one of which sees in it a sovereign remedy for all rural ills while the other is contained in the remark that through it only the C.D. department has developed continuously and

not the community. By all accounts, the truth appears that while it has made some impact on rural life by way of increased demand for social services, improved inputs and necessary overheads unknown to the villagers till recent past, but it has yet to make itself felt in the realm of economic development is, in the ultimate analysis, its *raison d'être*.¹

A better way of judging the value of this programme would be to determine to what extent it has provided and promoted certain dynamic factors needed for rural development. Most important, among these factors are: (a) the volume of created marketable agricultural surpluses; (b) the volume and rate of capital accumulation in different forms; (c) the building up of an infrastructure in the rural side to promote development; (d) the introduction of improved and new techniques in the agricultural and related industrial activities.

An attempt is made here to intensively introspect the assessment of the contribution of the Programme.

(a) Increasing Agricultural Production

The primary significance of programme lies in its role in increasing agricultural production and its capacity to supply marketable agricultural surpluses. It has been emphasised over and over again that the "availability of agricultural surpluses promote capital formation in other sectors of the economy."² The farm surplus is a function of various factors, economic as well as social like productivity, nearness to market, minimum prices, level of consumption, etc., but all the same it represents the degree or prosperity of farmers and extent of success of extension work, judged by the presence of various overheads in rural areas so necessary for attracting maximum available surplus out of traditional pockets.

Increase in agricultural productivity is the result of various inputs. But unfortunately, the Programme has failed to provide these. The use of fertilizers is even now very meagre and even that is not cheaply available. Preparation of green manures and compost manures can be and have been taken up by Projects but even here their impact is not at all impressive. Large number of compost pits are undoubtedly dug but only at few places has the practice taken deep roots.

The use of improved seeds has of course, received some impetus but in terms of area it can be considered as dismally poor, since hardly 35% of land under food crops has been brought under

1. M. L. Bhat, "Community Development Programme in India at the cross-roads", *The A. I. C. C. Economic Review*, Vol. 18, No. 11, December 15, 1966, p. 33.
2. M. Dobb, *Some Aspects of Economic Development : Three Lectures*, University of Delhi, Delhi.

Community Development Programme

S. No.	Item	Total Achievement during		Average Achievements per Reporting Block during	
		1975-76	1976-77	1975-76	1976-77
I Agriculture					
1.	Improved seeds distributed (quints)	7397000	7415000	1555	1665
2.	Chemical Fertilizers distributed („)	47393000	56769000	9963	12749
3.	Chemical Pesticides distributed („)	811000	834000	171	187
4.	Total value of improved implements distributed (Rs.)	20378000	36836000	4284	8272
5.	Compost Pits filled (Nos)	6360000	6136000	1337	1378
II Land Improvement					
1.	Land reclaimed (Hects.)	247000	275000	52	62
2.	Area bunded/Terraced (Hects.)	750000	753000	158	169
III Animal Husbandry					
1.	Improved Animals Supplied (Nos.)	64000	79000	13	18
2.	Improved Birds supplied (Nos.)	1813000	1821000	382	409
3.	Animal Castrated (Nos.)	3616000	3654000	760	821
4.	Animals artificially inseminated (Nos.)	3167000	2944000	666	661
IV Health & Rural Sanitation					
1.	Rural latrines constructed (Nos.)	—	38000	8	8
2.	Pucca drains constructed (Meters)	956000	1017000	201	228
3.	Village lanes paved (sq. Meters)	2647000	7177000	556	489
4.	Smokeless chulhas installed (Nos.)	17000	18000	4	4
5.	Gobar Gas Plants set-up (Nos.)	14000	16000	3	4

6. Drinking water wells constructed (Nos.)	18000	20000	4	5
7. Drinking water wells renovated (Nos.)	20000	25000	4	6
8. Primary Health Centres in existvnce (Nos.)	5239	5276	4	6
9. Family Planning centres in existence				
(a) Rural (Main centres)	5132	5168	1	1
(b) Rural (Sub-centres)	33370	37690	7	8
V Social Education				
1. Adult-Literacy centres started (Nos.)	18000	21000	4	5
2. Adults Made Literate (Nos.)	356000	385000	75	86
3. Sewing Centres started (Nos.)	13000	16000	3	4
4. Women trained sewing Centres (Nos.)	143000	161000	30	36
VI Communications				
1: New kaccha roads constructed (Kms.)	15000	13000	3	3
2. Existing kaccha roads improved (Kms).	50000	57000	10	13
3. Culverts constructed (Nos.)	19000	15000	3	3

improved seeds. The progress in this case is hardly uniform amongst different crops and in different states.

Regarding provision of irrigation facilities, the Programme has not played an active role. There has been a total failure to use the additional water, made available to grow two or more crops.

Equally important is the fact that nothing has been done against insects, pests, etc. The efforts towards this end have been feeble is corroborated by the fact that only 22% of the total area under foodgrains has been brought under different pest control schemes.

As regards various demonstration farms, the results have not been convincing as evidenced by the findings in Rajasthan which showed that only 0.6% of the farmers who witnessed the demonstrations, were convinced of the importance of using improved seeds or more fertilizers. These demonstration farms, in many cases, have neither shown the farmer how to switch from moribund and traditional form of agriculture to a more modern and scientific pattern, nor have these proved conclusively how to switch from moribund and traditional form of agriculture to a form for the better. The major has been the inability of the well educated research workers to talk on the subject in a way intelligible to the illiterate conservative farmer.

Even in the case of improved implements, the achievement has been very moderate.

Shri Krishnamachari, in his presidential address to the annual conference on C. D. in July 1961 at Hyderabad remarked that the "main reason why the benefit of the programme was not evenly distributed was that the three most important programmes, on which agricultural production depends had not been carried out efficiently enough. These three programmes were : (i) major, medium and minor irrigation work ; (ii) afforestation, soil conservation and contour bunding ; and (iii) production work had not been carried out efficiently enough. These *marketable surplus has been but moderate.*

(b-c) The Volume and Rate of Capital Accumulation and Building up of Infra-structure

It was expected that the C. D. Projects could be made to subserve the larger interest of physical capital accumulation in rural blocks area through several means such as provision of co-operative credit facilities, greater utilization of existing unemployed and under employed man-power for rural development activities, promotion of thrift habit and banking habit among villagers, and fillip to cottage industries. But in reality these projects have not shown any special effort in this respect.

Though co-operative credit has risen from 3 to 17 per cent of the total rural credit available to the villagers, the amount available per member is nothing but insignificant, the rise being from Rs. 44 in 1950-51 to Rs. 140 in 1969-70. Despite existence of co-operative credit societies, the tribals have to secure credit from money-lenders at as high an interest rate as 50 to 75 per cent.

The U. N. O. Report rightly pointed out that "Investments made so far have tended more in the direction of building up social capital such as roads, wells/schools, hospital recreation centres, culvertdigging etc. rather than in the direction of agricultural improvements"¹ thereby manifesting their bias in building such infrastructure in the country-side most of which has least enduring values. Greater production oriented the infrastructure in the C. D. areas is the greater will be the economic growth of the country. As pointed out by the U.N.O. experts the "C.D. Programmes can contribute to the building up of social overheads and expansion of rural infrastructure, thus helping to free government resources for major national investments."² The laying in of village and link roads ; improvement in cattle life through 'semen banks' and 'key villages'; the supply of electricity and drinking water to the villages, digging of feeder canals etc. will bring about more external economies to the rural industries and other economic activities.

The addition to the capital stock in agriculture in rural areas has so far been generally in terms of land and/or housing more out of social rather than economic considerations. As compared to the increase in the area sown, the increase in supply of improved implements and machinery has not been significant. Implicitly the impact of the programme on the nature of the asset composition has yet to gain momentum and recognition. The greatest hurdle in the way of agricultural capital formulation has been the lack of credit and increased diversion of available funds to unproductive channels.

The two main reasons for the failure of the programme in the promotion of capital accumulation are : (i) the increased income in the rural areas resulting from developmental activities are only being eaten up by the increased family size and increased cost of living ; (ii) one of the basic aims of these projects is to instil an ambition for higher standard of living which is called the improvement in "broaden human aspirations." So the increased incomes, if any,

1. U. N. Report on Community Development Evaluation Mission in India 1959, para 36,

Dr. Myrdal observes, "When the Government suddenly opened new vistas for improvement, but limited its initial offer of assistance to the short span of three years it was natural for both villages and civil servants to put other things aside in order to seize this unprecedented opportunity. Those who took an active part in the programme became absorbed in planning and carrying out programmes for schools wells, roads, paved village streets, and so on"—G. Myrdal, *Asian Drama*, Vol. II. p. 1340.

2. *Ibid.*, para 105.

in the countryside are only taken as aid to satisfy the immediate material ambitions ; and therefore, the motive to be accumulated is relegated to the background. Therefore, if the C. D. Projects are to spearhead the movement for rural development they should see that the society is transformed from having a low saving ratio to one having a high saving ratio.

The industrial capital formation in the project areas is almost nil because, *firstly*, the project deals mostly with agriculture ; and *secondly*, rural industries are the 'weakest' in the Programme. We have developed only some uneconomic units like the khadi industries. Whereas these have provided some sort of employment to the countryside in the deep interior their lives have virtually been tied up to a backward economy with no prospects of immediate improvement in their lot.

(d) **Related Industrial Activities.** Rural development is possible only by adding small modern industrial units, in the rural areas, which could be feeder to bigger industries.¹ These will not only bring income to the rural population but will also teach them modern economy in the process. This will help to reduce the gulf between the city dwellers and the villagers ; it will cut off excessive dependence on the outside urban sector for its essential complementary factors ; it would make the rural sector strong and would prevent the migration of skills from the rural sector as the industrial segment in the rural sector would be capable of absorbing them to a great extent.

In this context it may be noted that the scheme of rural industrial estates aiming at decentralising and diversifying the industries in rural areas, was launched. But a review of their programme shows that the rural industrial estates are hanging loosely cut off both from the 'dense' industrial sector and the 'poor' agricultural sector.² If these estates are to serve the overall aim of economic growth of the country, they should be integrated with community development programme. It appears reasonable to make each industrial estate a part of the mixed type of C.D. Project ; or in case an industrial estate is large enough, it should be constituted as a separate entity i.e., 'urban type community development project'.

1. "Promotion of the all-sided development of the village community is possible through the simultaneous development of both agriculture and industry within the rural sector itself for a purely agricultural country is likely to be unprogressive even in its agriculture."—Galbraith, quoted by Higgins, *Economic Development*.
2. This apart there have been delays in the allotment of sheds after they have been completed, occupation of sheds after they have been allotted and commencement of full production after occupation. This state of affairs has been the result of (i) non availability of trained personnel ; (ii) lack of entrepreneurial ability ; (iii) lack of means of transportation ; (iv) higher cost of construction ; (v) additional overheads ; (vi) lack of basic overheads like power and water ; (vii) lack of marketing facilities.

But incorporation of these industrial estates into project areas will not solve the problem because they will have any specific role in assisting agricultural development. So an industrial estate, constituted as a separate entity, should be linked up with pure rural type project and both the urban industrial state project the rural project should be made to look upon each other as a source of supply of necessary and available complementary factors for rural development. It is easier in this way to achieve the kind of balance necessary.

Other defects of the programme are :

(1) Uneven Distribution of Benefits of the Programme. An important disquieting feature of the programme has been the uneven distribution of benefits in the community. That the programme has not benefited the weaker sections to the extent it had vouched is evidenced by various surveys. In the study undertaken in U. P. it was found that "the whole programme has suffered from a lack of vitality and is tending to degenerate only in a number of material benefits for a limited few."¹ The benefits of community development have reached a certain strata of society and those below it do not have the capacity to take advantage of the benefits offered by the programme only those persons in the village who have an access to the Block Officials are able to obtain government assistance. The artisans, the landless labourers, and small agriculturists, for whom the programme was launched, hardly receive any grants, loans, improved implements etc.² The result is that, despite the lapse of 20 years, the bulk of rural population is still continuing to live in poverty, ill-health and conditions of starvation while one may boast of an extension service spreading over the entire country.

(2) Absence of Clearly Defined Priorities in the Programme. The programme has been very ambitious from the very beginning. It tried to encompass all aspects of human life, and therefore, it covered a wide range of activities comprising fostering agricultural development, setting up rural industrial estate, improving health, education, youth and women welfare, adult literacy, organisation of recreation centres, etc. All these objectives cannot be achieved simultaneously. The result is that it has not been able to do anything satisfactorily. The C. D. Project must not fritter away their

-
1. In another study pertaining to U. P. it was pointed out : "A closer analysis of the agricultural extension work itself reveals that near 70% of its benefits went to the elite group or to the more influential and affluent agriculturists."
 2. *Govind Sahai Committee for U. P. on the Evaluation of C. D. Programme.*

Says Shri S. K. Day, "One of the disabilities under which the C. D. Programme suffered was that the Programme functioned more as one of the developments of the individuals. The catalyst for community-making has not been easily obtaining."-- S. K. Day, *Community Development : A Bird's Eye-View*, pp 79-80

funds over too many lines of activity which has resulted in costly experiments in the project areas besides; such spraying has also taken away the potential 'demonstration effect' of few projects, nearly executed. The C.D. Projects, therefore, should have avoided this kind of wasteful investment and instead concentrate on 'seminal' investments. The first priority should have gone to stepping up agricultural production and providing employment to rural masses. Other low priority activities could have been taken at a later stage.

(3) **It has not been a People's Programme.** The programme handed to the C. D. personnel for execution was not a people's programme. "The blueprint came down from some pinnacle or the other and when it reached the "grass root" level it had assumed the halo of the inviolable scripture." It was taken for granted as a rigid pattern to be followed in each and every block without questioning. No block was considered to be full fledged till the whole range of extension officers were in a position to introduce in a comprehensive manner all kinds of programmes irrespective of whether there was need for scope for all of them.

(4) **Maze of Unqualified Band of Extension Workers.** The large army of extension workers provided in each block, were less a source of help to the villagers than bewilderment and confusion for lack of co-ordination among them. The workers had little or no training and background for extension work among rustic folk. No survey and collection of information was attempted to draw up a bench mark to assess the felt need. Contrarily, the blueprint programme was made applicable and introduced in each area in a ritualistic manner without regard to the existing levels of development in the economic, social and educational life of the communities involved, their likes and dislikes, aspirations and aptitudes.

(5) **Less Emphasis on Physical Achievement.** Considerably more emphasis was put on the quantum of funds utilized rather than on physical achievements. There has been a widespread complaint of misapplication and misappropriation of funds.

(6) **Ritualism.** A spirit of ritualism permeated the block programmes and inauguration, opening or foundation stone laying became the be-all and end-all of all block activities. The project officers were purposively emphasising the welfare aspect of the programme so that they could show to the visiting dignitaries some tangible result of their efforts. But the creation of these welfare activities only kindled the dissatisfaction with the economic condition of the people. If community development is to win the confidence of the people, emphasis should be laid on different aspects of economic development rather than on welfare activities.

(7) **Lack of Functional Responsibility.** Three parallel lines of control and supervision over the block personnel exist. The bosses of the general administration, the high-ups in the technical cadres and the panchayati raj authorities—all vie with each other in exerci-

sing the function of control and supervision. There is neither functional nor jurisdictional distribution of responsibility. This has been responsible for a good deal of confusion besides creating bad blood between the agencies over the exercise of power.

The Bright Side of the Programme

C. D. Programme has, nevertheless, registered a discernible impact and has made certain contribution. "A countryside organisation has been developed through the net-works of which the villagers can be reached It has created a new class of functionaries with a new outlook for work in a unit of administration and developed new procedures of working with people. It involved a teamwork approach to service bringing about co-ordination of technical and administrative services. It fostered and promoted growth of democratic forms of participation such as staff meetings, seminars, discussions, study tours etc. It evolved a system of current evaluation as a part of the programme and genuinely sought correctives. It gave a new meaning to people's institutions such as panchayats, co-operatives, school and community centres. It attempted to dispense social justice by extending the benefits of the programmes as evenly as possible among all sections of rural communities. It created infrastructures through area development and promoted an integrative, holistic and multi-purpose approach to rural development. It built up a system for utilising resources of the rural communities, their man power, talents, and leadership and also provide common meeting ground for people's representatives and people's servants."

The U. N. Team which visited India in 1959, had noted that "the programme is bringing about a change in the people's attitude in the areas covered by it. The shackles of the age-old bondage of superstition and fatalism are being loosened. Wasteful expenditures on ceremonies like marriage and funerals are being frowned upon and more money is put to improvement of lands."

The programme has brought social changes. "The Programme has added a new dimension to the slow process of change and sponsored an attempt to generate community consciousness to solve community problems through community participation. Through three major fields of activity regeneration of the rural economy, development of secular institutions and the introduction of panchayati raj, it has been trying to modernise the whole range of rural life."² The process of modernisation taking place in India is a kind of a synthesis between the traditional and the modern. The leadership which fuses traditional with modernity has become the spear-

1. U. C. Ghildayal, "Community Development and rural growth," *Khadi Gramodhyog*, Vol. XIV, No. 5, 1968, p. 398.
2. *Awareness of Community Development in Village India*, Pre-Report of the National Institute of Community Development, Hyderabad, 1966, p. 19.

head of a renaissance which has released and facilitated social mobility.

The functional boundaries of village community have widened and they are no more the kind of isolated entities they once used to be. About 91% of our villages have primary schools, and 84% have middle schools and about 61% have high schools within 5 miles, villages have co-operative societies and a similar percentage of the panchayati offices located in them or within one mile of their boundaries. 38 percent of the villages have community centres and 45% of them have libraries. About 42 percent of the villages have village level workers' office.¹ It has been found that 86.6 per cent of the people in the rural areas have become aware of the Programme. The agency and its functionaries have reached the common man to provide him with a channel to articulate his grievances and needs.²

There has also been a marked improvement in adoption of health practices. The infantile morality has declined and so has the incidence of epidemics. Vaccination against small-pox has got wide acceptance in villages and T. B. injections are being extensively used. 5,276 primary health centres had been set up and quack and indigent methods of treatment are making way for scientific medical practices, 5,168 family planning centres have also been set up which have encouraged the people to undergo operations or use contraceptives. Safe drinking water facilities have been increasingly adopted and people have become more conscious of hygienic living. The network of roads and transport links have pushed in new areas within the ambit of market economy.

General Appraisal

A general appraisal of the working of Programme in the country indicates that, in spite of various difficulties and problems, it has proved a valuable asset to general economic and social development. The programme became catchy enough to spread fast and wide so that it created demands which far outstripped the available supplies and services. It awakened consciousness in the people and made them articulate for needs which they had not felt before. With the net-work of a co-ordinated structure of extension teams, co-operatives, farmer's associations, youth clubs and other voluntary organisations, it has helped the tradition-bound village communities to shed-off dogmas and overcome resistance to change and has thus made its own impact on people's attitudes and motivations. It has made people pragmatic and rationalistic. By the very process of stimulating aspirations for planned development, the programme has led to the establishment of new statutory local government institutions and the strengthening of the existing ones. But in spite of these achievements, it has yet to make itself felt in the realm of economic development which, in the ultimate analysis, its *raison d'être*.

1. *Ibid.*, p. 53.

2. *Ibid.*, p. 19.

Remedial Measure

If the Programme is to succeed, and if it aspires to take the new techniques to all agriculturists in convincing manner, the following actions may be taken :—

(i) It should completely replace the unqualified band of village level workers with qualified agricultural demonstrators and entrust to them the programme of agricultural extension. Agricultural production can be increased by supply of improved tools, simple machinery, fertilizers, insecticides, irrigation facilities, and prompt supply of technical know-how when needed.

(ii) It should help create a chain of co-operative societies especially for the supply of easy credit facilities in the shape of various agricultural inputs required by the villages and for the dissemination of technical knowledge which every agriculturist can freely borrow. It is through such co-operatives that the Programmes will be able to inject required "technical dynamism," to borrow Dr. Myrdal's phrase, into rural areas.

(iii) The panchayati raj organisation should be charged with responsibility of advising the block machinery in the formulation and execution of the programmes and be not made responsible for the execution.

(iv) As far as possible, the block should have multi-purpose rather than multiple-extension workers. Their number should be reduced to a minimum having regard to the potentialities of each block.

(v) The instructions from above should be in the nature of guide-line only and the blocks should be left free to chalk out their own programmes with the aid of these guide-lines, advice tendered by the panchayati raj representatives, and the felt needs of the locality as decided upon in consultation with the people's representatives.

(vi) The villagers should be apprised fully of the details of each scheme ; and an urge should be created for its adoption, and they should be assisted with the necessary equipments, know-how, raw materials, etc.

(vii) To improve the tribal areas more rapidly and bring efficiency in the development programmes of tribal blocks, the Sub-Committee on Tribal Welfare (at Mt. Abu) made the following recommendations ; (a) The State Government should give highest priority to the multi-purpose Tribal Blocks and should try to post the full contingent of staff within the earliest possible time. (b) In order to encourage the staff in various departments to learn the tribal dialects, special awards should be given to those persons who learn and pass tests in recognised local tribal dialects. (c) Special orientation course of 2 to 3 weeks' duration in the special problems

of tribal areas should be arranged for block officials including V.L. Ws. (d) When the tribal people are unable to contribute even upto 25% as their share for certain items, the Development Commissioner should be authorised further to relax the quantum of contribution in special cases.

The Consultative Council or C. D. and Panchayati Raj, at its third meeting (on 6th February, 1974) made these recommendations:

- (i) In every State the subject of C. D. and Panchayati Raj should be under a single Minister to avoid lack of co-ordination.
- (ii) A small committee (of about 3 persons) should be constituted to go round the States, see the manner in which the programmes were implemented, report about what they see and make suggestions for how things can be improved.
- (iii) In a nutrition programme the emphasis should be not only on feeding but on encouraging rural people to produce the nutritious food and to consume it.
- (iv) A policy paper should be prepared by the Rural Development department showing how it proposes to bring about coordination in the Plan programmes for rural development being implemented by various departments.
- (v) Training and functionaries connected with Community development and panchayati raj needs to be considerably strengthened.

ANTYODAYA MOVEMENT

Antyodaya movement seeks to obtain an egalitarian pattern of community life through self-motivated actions of its members. Egalitarian pattern in community life is reflected by obtaining a living standard which, in quantitative terms, is neither too big to cause display of extravagance nor it is too small to cause deprivation of necessities for human existence. Through self-motivated actions rich people espouse the cause of poor's welfare in the community. This is in nut-shell the way Gandhian philosophy adminishes the meaning and objectives of Antyodaya movement precisely fixing a responsibility on the rich persons in the community to look after their poor neighbours not with the feeling of gratitude but with the feeling of utmost duty.

New Concept

To-day, the above meaning of Antyodaya seems to have changed a little as the State Government has assumed the responsibility of discharging the role of the community's rich. For example, the Government of Rajasthan followed by Uttar Pradesh have announced adoption of Antyodaya programme for improving the lot of the rural poor on selected sample basis. Selection of the poorest family in

the rural area is done by the local Gram Sabha following the criterion of identification laid down by the State Government which analyse the economic condition of the rural poor on the bases noted below :

(a) a family having no economic assets, viz., land, cattle or other visible property; in such family there is no person in age group of 15-59 who is capable of economic activity due to infirmity, disability or old age ;

(b) a family who have no economic assets but include one or more persons in the age group of 15-59 and their total income does not exceed Rs. 1,200 per annum with five members in the family ;

(c) a family of landless workers or rural artisans having annual income ranging below Rs. 1,200 to Rs. 1,800 for five members in the family ;

(d) other families whose per capita income is Rs. 55 or below.

Following the above norms Rajasthan Government has adopted Antyodaya programme initially in 33,000 villages beginning on October, 2, 1977, thereby identifying five poorest families in each village. The scheme stipulates selection of five families each year in each of these villages and also in others so that it progressively covers the wide range of poors. In 1977, Rajasthan Government had benefited 45,700 families whereas in 1978, 1,60,000 poorest families were identified. These families were granted relief in the shape of allotment of land, food for work programme, allotment of house sites and financial assistance for construction of house, cattle loans, and also facilities of financial help for small and village industries.

Amongst other state governments, Uttar Pradesh has recently announced adoption of the Antyodaya programme on more or less the lines adopted by the Rajasthan Government. The relief to poorest people in other states in the shape of unemployment allowance or guaranteed employment could also be taken as an Antyodaya programme because these schemes directly render financial assistance to the poors to subsist in the community. *Maharashtra Employment Guarantee Scheme* for rural areas ensure employment to all able bodied persons to do unskilled work. Recently announced "18-Months Action Plan for North Bihar" for creating jobs for ten lakh people in rural areas has also been envisaged to give relief to poor people. Adoption of a scheme giving benefits to unemployed persons in the states of West Bengal and Kerala also provide relief to poor people. All these relief programmes are kith and kin to the state sponsored Antyodaya.

Antyodaya and other Schemes

The difference which lies between Antyodaya and other relief programmes for rural poors is of significant nature which should be

noted. Antyodaya is not a manpower development programme. It is neither meant for creation of job opportunities for the poor nor it deserves to be implemented by state authority. On the other hand, it is a community action programme envisaging pooling of community resources through personal willingness of rich members and their affectionate disposition towards their poorer colleagues with the sole objective to bring definite amelioration in their living conditions and uplift of their economic status. Since government has not been able to inspire the rich persons of the community, it has taken lead to influence their behaviour through economic relief programmes under differing names and styles named above. So, these government sponsored programmes are no better than the scheme affecting redistribution of national income in favour of the poor.

Notwithstanding the above facts, the state governments who have embraced the Antyodaya programme should have lessons from the past experience when they launched ambitious community development programmes through Block Development Agencies and did not obtain desired results. The bureaucratic attitude of the government is required to be replaced by a humanistic and systematic approach. The progress of each and every effort made for the uplift of the economic condition of the poor should be assessed by results; inefficiencies should be checked and remedied; social cost of the implementation be compared with the social benefits to the community through reduction in poverty and Economic uplift of each and every one of the affected poor. The most important thing needed through government action is to motivate the community action at local level devoted for the economic and social uplift of the poorer members of the community. In a way the joint efforts of the government and the community should generate the following conditions aiming to achieve rural prosperity through obtaining Antyodaya conditions in local areas :

- (i) Equalisation of actual income and wealth;
- (ii) Equalisation of opportunity of earning ;
- (iii) Equalisation of consumption ;
- (iv) Equalisation of total happiness.

Equalisation of actual income and wealth

The capacity and ability of the rich people for generating additional income and wealth in the society should not be reduced for obtaining condition of economic equality rather the ability and capacity of poor persons and families in the society should be so improved that they pick up generating income and wealth of the size and magnitude equivalent to the rich members of the community. Equalisation of actual income and wealth takes place in the society when each and every member earns so much to be able to conveniently meet own family's daily needs for basic existence, reequipping physical energies and reinvesting for generating new wealth to continue the productive process going on.

The gap in income and wealth of the rich and poor in rural areas is widely scattered. *Bhoothalingam Committees Report on Wage, Income and Price* (1978) present interesting data evidencing wide-spread income and wealth disparity amongst the rich and the poor. According to this Report, half of the rural population, viz., 238.6 million falls below poverty line. The 20 per cent bottom in the decile group if compared with 20 percent top rich so that the income of the former was 8.00 points as against 42.00 points of the latter group (at 1970-71 price level) and the assets possessed by each of these groups respectively ranked as 0.8 points for bottom 20 per cent 69.0 points for the top 20 percent. Further the gap in the rural and urban incomes can be observed from the following data as reported by the Bhoothalingam Committee :

Share of Disposable Income in percentage

Decile	group	Rural	Urban
Bottom	10	1.83	1.97
Bottom	30	8.65	9.43
Bottom	50	18.88	20.43
Top	20	53.33	52.54
Top	10	36.60	36.92

The above data reveal existent vast disparity in income and wealth of rural population and their urban counterpart. The incident of poverty is more severe in rural areas than in urban areas. *Expert Committee of the Planning Commission* places 60 per cent persons below poverty line in rural areas as against the all-India total of 50 percent (at 1973-74 prices). According to the Bhoothalingam's Report, quoting the 28th Round of National Sample Survey, the percentage of people below severe distribution was estimated at 13.4 as against urban counterpart being 12.56 with their respective total points 43.2 (rural) and 12.56 (urban).

Corrective steps needed to avoid the above gaps of income and wealth amongst the rich and poor in rural areas be comprised of two measures, viz. :

(i) Rich members of the community should assume voluntary redistribution of their income and wealth resources on the welfare of the poor members of the community. Rich will feel no pinch of their self sacrifices in comparison of the higher degree of direct taxation which the government always resort to in the absence of an appreciable favourable response from the rich community. The help from the rich community to the poor sections should be rendered in the following kinds :

- (a) Voluntary educational grants to poor students for maintaining clothings and dress, books and out of pocket expenses ;
- (b) Charitable dispensaries and child welfare centres for free medical help and help in rural areas ;

- (c) maintaining environmental improvements in the locality of the poor ; and
- (d) Arrange for community meals in the rural areas for poor families periodically.

(ii) The programmes undertaken by the government, through varied agencies, in the rural regions should continue only if they have been found beneficial in comparison to social costs being incurred on their implementation. The present Antyodaya programmes sponsored by the state governments should assume the form of a "*Guaranteed Income Scheme*" which implies redistribution of national income, and, involves a process of transfer of wealth from haves to havenots through the system operated by the government machinery. The scheme shall broadly cover three aspects, viz :

- (a) it shall guarantee the risk aspect for non-remunerative but creative activities and, thus, create job opportunities for all interested work seeking persons ;
- (b) it shall create conditions for all wage earners and self occupied persons to maintain a standard of living acceptable in society reflecting happiness conducive to maintain the productive energies by supplementing the income of those who have less than the expected or required returns from their work for such a living standard ;
- (c) it shall create comprehensive framework of incentives for the trained manpower to work in productive activity even on lesser economic returns.

II. Equalisation of Opportunity of Earning

Increase in income and wealth will not remove rural poverty unless a regular source of income through gainful employment is assured to the poor persons. Lack of earning opportunities create destitution and poverty. State governments in various states and also the central government have taken various steps to ensure work opportunity to the poor persons which include :

- (a) providing wage employment through aid programmes to the unemployed persons ;
- (b) fixing minimum wage for the work in different work situations to avoid unwanted exploitation of the poor covering agricultural and allied activities ; and
- (c) implementing programmes for the skill development and training of poor people for enabling them to seek self-employment.

A survey of the recent steps taken by the Central government for providing employment opportunities to the needy sections of the society in rural areas, reveals that government has espoused the cause of providing earning opportunity to the persons of less-privileged classes as under ;

(i) Under the *Pilot Intensive Rural Employment Project* (PIREP) government has taken up various schemes for implementing crash programme for rural employment and providing useful information on employment situation and methodological issue for generating employment to rural areas ;

(ii) Annual Report for the year 1977-'78 issued by the ministry of Agriculture and Irrigation reveals that a scheme to augment non-plan funds for state governments for maintenance of public works on which large investment has been made in the past was introduced from April 1977 for a period of two years which include three broad aspects and objects, viz :

- (a) better maintenance of public works both in the state and belonging to local bodies on which investment has been made in the past ;
- (b) utilisation of surplus food, grain stock of government as a resource for meeting the additional expenditure required for the purpose ;
- (c) generation of additional employment opportunities in rural areas.

Thus, the scheme *in toto*, covers the following works : major, minor and medium irrigation work ; flood protection, drainage, anti-water logging measures ; soil conservation and afforestation on government and community land ; road constructions and maintenance including state high ways ; dam construction and construction of school buildings, community centres belonging to government and local bodies including Panchayats. State governments have taken interest in the scheme having requisitioned 5,13,822 metric tonnes of wheat and 21,688 metric tonnes of milo from Andhra Pradesh, Assam, Bihar, Gujarat, Haryana, Maharashtra, Orissa, Kerala, Karnataka, Rajasthan and West Bengal against which 1,60,840 metric tonnes of wheat and 1,850 metric tonnes of milo have been sanctioned by the Central government.

(iii) Besides the above efforts, generation of additional job opportunities for the rural people is the main objective under the *Integrated Rural Development Scheme*. This scheme was also launched in 1977 on experimental basis in twenty districts selected on the socio-economic and ecological consideration with the following objectives:

- (a) overall growth and production in rural areas ;
- (b) benefit to the identified target groups in disadvantaged sections of rural community ;
- (c) full employment with a certain time frame. The scheme assumes two phases, viz.
 - (i) preparation of resource inventory, malady analysis and action plan for selected area to harness local untapped human and physical resources ; and

- (ii) implementation of the programme. The beneficiaries under the scheme are the rural poor known as 'target group' covering small and marginal farmers, tenants, share croppers, landless labours, rural artisans, members of scheduled castes and tribes, and economically and socially handicapped persons. The scheme covers development and intensification of agriculture horticulture, animal husbandry, dairy, poultry, fisheries, sericulture, forestry, irrigation, land development, soil conservation, water management and agro-forest-based village and small industries. Further, the said scheme also aims to augment the conditions for self-employment of rural artisan and craftsmanship seeking active involvement of the people and voluntary organisations.

III Equalisation of Consumption

To obtain a state of rural prosperity it is also essential that the per capita consumption of the rural families, living below poverty line, should be increased to the extent that no disparity is left in the level of consumption between the poor and the rich. The data available on per capita consumption is divergent but gives a rough estimate of the prevailing disparity. The *Fifth Five Year Plan* document quotes private minimum consumption at Rs. 20 per capita per month at 1960-61 prices and Rs. 40 at 1972-73 prices. The average per capita consumption of bottom 30 per cent of the population has been estimated at 13.45 per cent of the private consumption. Bhoothalingam Committee in its Report quote Expert Committee on Planning Commission citing per capita consumption at Rs. 53 in rural areas and Rs. 62 in urban areas at 1973-74 prices whereas Dandekar and Rath had assessed per capita consumption on the basis of nutrition requirements at Rs. 15 per month in rural and Rs. 22.5 in urban areas at 1960-61 prices. Planning Commission while using norms of calorie consumption has linked poverty in 1977-78 at 48 per cent in rural and 41 per cent in urban areas. If the percentage of consumption of the 20 per cent bottom in the decile group is compared with the 20 per cent top rich persons then the disparity at 1973-74 prices ranges between 9.05 per cent and 38 per cent respectively, as per the findings of the Bhoothalingam Committee. This is a wider dimension of disparity and lot of efforts are required to equalise per capita consumption between rich and the poor.

Increase in income and wealth and opportunity for earning no doubt will cause increase in the consumption rate per capita for the people. But to create a circulationary impact in the economic system separate efforts are required to be made through marketing efforts and demonstration impacts upon the rural population so as to widen their need pattern for increased consumption and better living standard.

IV Evaluation of Total Happiness

The above three efforts shall enhance the quality of life of the rural poor and promote happiness amongst them. Happiness is the

reflection of mental satisfaction when a person in the society feels equal in status and well being. A rich cannot feel happy amidst the poors in the society and his happiness shall be measured by the happiness of the persons in the surroundings. So directly or indirectly all the members in the society are required to contribute happiness in the surroundings by sacrificing their labour, money and assets for the benefits of the needy sections in the society.

If sincere efforts are made by the government and the people to obtain the above conditions then the achievement of goal of rural prosperity will not be so difficult as it appears to-day. All the above four conditions are essential to obtain a state of Antyodaya in rural community. The Gandhian philosophy embraces the idea of a better standard of economic living but at the same it preaches for attaining a high standard of life which is to be reflected from the interaction of the different sections of the society. Without the fulfilment of the latter condition there cannot be any state of Antyodaya. This is so because the poverty of economic conditions can be removed but poverty of thoughts and culture is very difficult to be removed. High standard of life reflects enrichment of thoughts of the members of the whole community with a reflected behaviour full of compassions, love, affection and dedication to each other. In view of this mere government sponsored Antyodaya will not create desired results unless the whole village community feels obtaining Antyodaya in their community through self-sacrifice, mutual co-operation and joint efforts.

MINIMUM NEEDS PROGRAMME (1978-83)

This Programme redefines the norms of nine items of minimum needs which were determined for the Fifth Plan. The items are : (1) elementary education, (2) adult education, (3) rural health, (4) rural water supply, (5) rural roads, (6) rural electrification, (7) houses for landless rural labour households, (8) environmental improvement of urban slums, and (9) nutrition programme.

The programme based on upgraded norms is designated the "*Revised Minimum Needs Programme*" (RMNP). This programme intended to fulfil the promise of providing essential infrastructure and social services, which the public sector alone can supply, to the weaker sections of the population, particularly in the rural areas. Because of its high construction component it will also create substantial additional employment for unskilled labour. In the proposed RMNP the elementary education, adult education and nutrition programme relate to urban as well as rural areas. The Programme for the environmental improvement of slums relates to urban areas. All other programmes are designed to cater only to rural needs. Urban needs in these sectors are proposed to be covered under general sectoral plans.

Targets

The targets implied by the revised norms are assumed to be achieved over a ten-year period ending 1988, except in the rural water supply sector where all left-over problem villages identified in the past are to be covered within the next five years. The general phasing proposed is that approximately 40 per cent of the total targets for the next decade be achieved by 1982-83, except in sectors where a special phasing is called for.

The Revised Norms

Table below shows, side by side, the norms adopted for the Fifth Plan and the revised norms now proposed.

Elementary Education

The government is committed to a more determined effort of the universalisation of elementary education for all children up to the age of 14. With this commitment in view it is envisaged that all children between the ages of 6 and 14 should be in schools by the end of the next decade.

The school-going population (between the ages 6 and 14) in 1988 is projected to be 72 million higher than the current enrolment. Normally, only about 97 per cent coverage of the age group is feasible, but complete coverage is assumed to allow for under-age or over-age entrants. The additional teacher requirement for handling this enrolment has been worked out on the basis of a teacher-pupil ratio of 1:46. With the revised ratio, the absolute additional teacher requirement would be 1.59 lakh during 1978-83 and 1.98 lakh during 1983-88. Half of the additional enrolment is anticipated to be given schooling in the formal system while the other half is to be provided for through the non-formal system. The total cost of employing the teachers has been computed on the basis of a unit cost of Rs. 5,300 per annum in the formal system. The non-teacher cost is about 25 per cent of teacher cost shared equally between the cost of accommodation and other non-teacher costs. In non-formal education the per pupil cost is taken as Rs. 70 per annum. The total outlay, thus calculated, amounts to Rs. 900 crores for the forthcoming five years (1978-83).

2. Adult Education

Along with the universalisation of elementary education it is essential to remedy the education deprivation of the adult population to enable them to develop their full potentialities and play an active role in economic, social and cultural progress.

The Ministry of Education and Social Welfare has spelt out the basic policy for adult education in the *National Adult Education Programme*. The central long-term objective of the programme is to create a situation in which the poor do not remain passive spectators but become active and intelligent participants of the developmental process.

FIFTH PLAN AND REVISED MINIMUM NEEDS NORMS

Head	Fifth Plan Norms	Revised Norms Achievable by 1988
1. Elementary education	Coverage of 97% of children in age-group 6-11 and 47% of children in age-group 11-14.	100% coverage of children in age-group 6-14 (90% coverage by 1983) Half of additional enrolment in the non-formal system.
2. Adult education		Coverage of all adults in age-group 15-35. Coverage in next five years to be determined on the basis of field experience and suitably enlarged.
3. Rural health	Establishment of one PHC per each community development block. Establishment of one sub-centre for every 10,000 population. Provision for drugs @ Rs. 12,000 per annum for each PHC and Rs. 2,000 per annum for each sub-centre.	Establishment of one PHC for every 50,000 population and one sub-centre for every 5,000 population. One community health worker in each village.
4. Rural water supply	Coverage of all the problem villages.	Coverage of all leftover problem villages by 1983.
5. Rural roads	Linking up of all villages with a population of 1,500 or more.	Linking up of all villages with a population of 1,000 or more.
6. Rural electrification	Assistance to only those States which have not achieved 40% coverage by the end of the Fourth Plan.	Coverage of 50% of villages in each State and Union Territory.

7. Sites and other help for housing landless rural labour households.

Provision of nearly 4 million houses.

8. Environmental improvement of urban slums.

Financial assistance to States or (a) Expansion of water supply, (b) sewerage, (c) paving of streets and (d) provision of community latrines in slum areas which are not likely to be cleared within next 10 years, but are amenable to improvement.

Environment improvement comprehending (a) expansion of water supply (b) sewerage, (c) paving of streets and (d) provision of community latrines in slum areas. Areas inhabited by scheduled castes, particularly scavengers etc., should be given due priority.

The scheme will be extended to all towns with a population of 3 lakhs and above. Where a town of this size does not exist one town from each such estate would be covered. Areas inhabited by scheduled castes, particularly scavengers etc. should be given due priority.

9. Nutrition

1. Mid-day meals for children in age-group 6-11 years.

1. Mid-day meals for one fourth of children in age-group 6-11 years.

2. Supplementary feeding programme for children in the age-group 0-6 years, pregnant women and lactating mothers in tribal areas, urban slums and chronically drought prone areas.

2. Supplementary feeding programme for undernourished children in the age-group 0-6, pregnant women and nursing mothers in blocks with high concentration of scheduled castes and tribes.

The removal of adult illiteracy should, of course, receive the highest priority in the programme. But the functional upgradation of neoliterates should also be given due importance. The content of education must be relevant to the learners' needs and environment. This means that the curriculum and teaching and learning methods and materials should be highly diversified, and arrangements regarding the timing, duration, and location of instruction should be sufficiently flexible to suit the situation of different groups of adults.

Under the adult literacy drive a variety of programmes may be designed to impart literacy with assured follow up, conventional functional literacy, functional literacy in support of a dominant development programme, literacy for conscientization and the formation of the organisations of poor.

Implementation of the Educational Programmes

As regards the implementation of the programme, it is proposed that the main responsibility be borne by state governments. But they should secure the maximum help of voluntary agencies, *yuvak kendras*, universities and employees of various categories in existing institutions, wherever such groups are available to undertake adult education work. The role of the government would primarily be to co-ordinate it. The precise tasks which different non-official or semi-official agencies take up will have to be defined according to their respective capacity. Where the voluntary sector is weak or non-existing the government will have to carry the entire responsibility for the programme.

In the beginning the programme would be concentrated in a few selected blocks and then extended. It is proposed to review financial allocation on the basis of concurrent evaluation.

Among the categories of persons who would engage in actual teaching, the following are obviously the most important : (1) school teachers, (2) students, (3) village youth, (4) ex-servicemen and retired personnel, (5) government functionaries, and (6) social workers, including education women.

The intention is that part-time contribution of all these categories of persons should be mobilised on a voluntary basis, but they should all receive an honorarium of Rs. 50 a month for their contribution.

As a part of the National Service Scheme, suitably modified, as well as outside the Scheme, it is proposed that students and teachers in institutions of higher education should also be invited to contribute to adult education work on a voluntary basis. University authorities and the organisations of teachers and students will have to be persuaded to create an atmosphere in which adult education work is undertaken by them willingly as a national service.

There are a large number of unemployed or underemployed youth in the villages with some education who can be entrusted with

responsibility for adult education after they are given some training and reorientation.

The involvement of educated rural youth in the programme will accelerate the programme and at the same time reduce rural under employment and create a new rural leadership.

Retired Persons do need some supplementation of their meagre pensions and other income, and also some meaningful work to keep them busy. After careful selection and reorientation they can also be invited to participate in the adult education programme.

Officials, health workers, *gram sevikas* and *bal sevikas* and office bearers of co-operative societies and village panchayats can also undertake some adult education work in their spare time, if any.

There are a large number of persons, particularly in the urban areas, who are willing to contribute to social work. They can be enabled to participate in adult education activity under special arrangements.

The estimated number of adults to be covered by the programme over the next decade is 100. million. The total cost of the adult education programme, over the coming five year period, amounts to Rs. 200 crores.

3. Rural Health

Currently a primary Health Centre (PHC) serves a population of 1 lakh and a sub-Centre (SC) serves 10 thousand. The revised norms suggested are : one PHC for 50 thousand persons and one for 5 thousand persons.

During the Five Year Plan (1978—83), 30 additional PHCs and 5,000 additional SCs will have to be established to fulfil the current norms. Besides, 33,000 more SCs will be needed to achieve the new norm of one SC per 5,000 of population by 1988.

During the subsequent five years (1983—1988) 6211 PHCs will be required to achieve the norm of one PHC per 50,000 population by 1988. Moreover, 40,550 SCs will have to be established, during 1983—1988, to achieve the desired norms by 1988.

Upgradation of 400 PHC into 30 bedded rural hospitals is also envisaged for 1978—83. The upgradation targets for 1983—88 is 2000 PHC.

The widening coverage of the system is expected into increase per capita availability of drugs.

The medical associations can play a critical role in generating greater empathy for the poor among their members. The health system will be strengthened by the Health Ministry's new *Community Health Workers Scheme*. The basic idea underlying the Health Ministry scheme to deploy paramedical staff on a large scale is commendable because :

- (a) it will mobilise personnel rooted in village communities for elementary health assistance to the people after a brief training ;
- (b) it can quickly cover a large population in respect of elementary medical aid ;
- (c) it can also spread some knowledge of preventive health care among the population ; and
- (d) it can lower the per capita cost of medical service in the long run. The cost of all the above programmes works out to Rs. 490 crores for the next five years.

4. Rural Water Supply

In a survey conducted in 1972-73, 1.52 lakh villages were identified as problem villages in respect of the availability of safe drinking water. They were categorised as follows :—

1. Those which did not have an assured source of drinking water within a reasonable distance (say 1.6 km.)	90,656
2. Those where the source of water supply is susceptible to water borne diseases like cholera and guinea worms ;	37,041
3. Those which suffer from excessive salinity, iron or flourides	24,778
Total ..	1,52,475

The on-going rural water supply schemes would have covered 95,653 villages out of the above 1.52 lakh villages by 1-4-1978 and 56,828 would remain to be covered. Subsequent to the last survey the state governments identified some additional villages as problem villages. Taking these villages into account the total number of problem villages to be covered will be 1.03 lakh. All these villages are to be provided safe drinking water during 1978-83. The cost of providing safe water per village ranges widely from Rs. 5,200 in West Bengal to as much as Rs. 7.85 lakhs in Mizoram. On the basis of the per village cost in each State, the total cost of covering the remaining problem villages, in the coming five years would be Rs. 675 crores.

5. Rural Roads

According to the old MNP norm all villages with a population of 1,500 or more were to have a road link. It is estimated that on the basis of this target, 76,300 km. of rural roads needed to be constructed as on 1st April, 1977.

It is proposed to provide a road link for all villages with a population of 1,000 and above by 1988. This norm would require 25,690 additional villages to be covered, and 77,094 km. of road-length to be built at the rate of 3 km. per village. This distance co-

efficient is higher than the previous one (about 2 km.) because smaller villages are more dispersed. In the selection of rural roads to be built or improved priority would be given to roads linking villages to the nearest mandal towns.

The total road length requiring construction by 1988 would be 1,53,394 km. It is assumed that half of this length would be black-topped. The total outlay in the five year plan is Rs. 800 crores.

6. Rural Electrification

As on 1st October, 1977, nearly 36 per cent of Indian villages had been electrified. But the coverage varied widely from 3.9 per cent in Mizoram to 100 per cent in Punjab, Haryana and a few other areas. Under the Revised Minimum Needs Programme it is proposed that by 1988 at least 50 per cent of villages should be electrified in every State and Union Territory so that inter-regional disparities in coverage are reduced.

This revised target would require the electrification of another 1,02,698 villages. Using the cost-coefficient of Rs. 60,000 per village, the total outlay required would be Rs. 250 crores over the next five years.

7. Housing for Landless Labour Households

Under any minimum needs programme only the housing needs of the poorest sections of the rural population, namely, landless rural workers, can be covered. It is estimated on the basis of the latest available National Sample Survey data that 17 million rural labour households without land need housing assistance. The rate of assistance for site development and/or a part of repairs or works assumed to be Rs. 750 per household. On this basis the total outlay, for the five year period 1978-83 works out to be Rs. 500 crores. This programme is to be given high priority.

8. Environmental Improvement of Urban Slums

Of the urban population, nearly a fifth is estimated to constitute the slum population. Thus, the estimated slum population in 1988, needing attention will be around 36 million. Of this only 5 million have been covered so far by some scheme.

The proposed environment improvement programme (IP) is to include : (a) water supply, (b) sewerage, (c) the paving of streets, and (d) the provision of community latrines. Areas inhabited by scheduled castes, particularly scavengers, etc are to be given due priority.

The average cost of providing these facilities for environment improvement is estimated to cost Rs. 150 per head of the slum popu-

lation. For covering 13 million slum dwellers, the total outlay for the five year period will be Rs. 190 crores.

9. Nutrition Programme

The nutrition programme covers two schemes, viz, supplementary nutrition and mid-day meals. Supplementary nutrition is designed for pre-school children (of less than 6 years of age) and expected and nursing mothers belonging to the weaker sections of the society. The mid-day meals programme is meant for school going children between ages 6 and 11. The mid-day meals programme attracts children to the school and proves useful in reducing dropouts.

Under the programme, the ten-year target of coverage for the under-nourished school-going children, belonging to the weaker sections of the society, will be a fourth of the total number. Thus, 25 million children will have to be covered. The minimum provision for mid-day meals is about 300 calories and 15 grams of protein per child per day for about 200 days in a year. At present the coverage is nearly 13 million. This is likely to increase by 4 million in the next five years.

Under the supplementary nutrition programme, blocks with a high concentration of scheduled castes and scheduled tribes are proposed to be covered. The programme envisages giving supplementary nutrition at least to the extent of 200 to 300 calories and 8 to 12 grams of protein per pre-school child per day for about 300 days in a year and about 500 calories and 25 grams of protein per mother per day for about 300 days in a year. The present coverage of the supplementary programme is about 6 million children and mothers. In the next five years about one-fourth of blocks with a high concentration of scheduled castes and scheduled tribes (about 514 in all) are proposed to be covered by the *Special Nutrition Programme (SNP)* component of the *Integrated Child Development Services Scheme*. In addition the SNP will cover one million children and nursing mothers during 1978-83.

The total cost of both the mid-day meals programme and the supplementary nutrition programme is estimated to be Rs. 174.5 crores during 1978-83. This amount excludes the coverage of programmes operated with foreign assistance.

The aggregate outlay required for the nine items of the Revised Minimum Needs Programme over five years ending 1982-83 and in the last year (1982-83) is shown below. Of the sum of Rs. 1087 crore to be spent in 1982-83, the fixed investment component is estimated to be Rs. 652 crore (at 1976-77 prices) and construction wage component as Rs. 140 crore.

Estimated outlays for the Revised Minimum Needs Programme in 1982-83 and over five years ending 1982-83.

Programme		Estimated outlay during 1978-79	Estimated outlay in 1982-83 (Rs. crores)
1.	Elementary Education	900.0	234.0
2.	Adult Education	200.0	52.0
3.	Rural Health	490.0	127.4
4.	Rural Water Supply	675.0	175.5
5.	Rural Roads	800.0	208.0
6.	Rural Electrification	250.0	65.0
7.	Housing for Rural Landless Labour Households	500.0	130.0
8.	Environmental Improvement, of Urban Slums	190.0	49.4
9.	Nutrition Programme	174.5	45.4
Total ...		4179.5	1086.7

Village Panchayats

HISTORICAL DEVELOPMENT

We can be proud of the fact that the institution of village panchayat was "developed earliest and preserved longest in India among all the countries of the earth."¹ It is believed that the system was first introduced by King Prithu while colonizing the Doab between the Ganga and Jamuna. In fact, the village in India had been looked upon as the basic unit of administration as early as the Vedic Age. *Gramini* or the leader of the village is mentioned in the *Rigveda*. There are definite references to the existence of *Gram Sanghas* in the *Shantiparva of the Mahabharat* and *Manu Smriti*. References to the Gram Sabhas or local village assemblies are found in the *Jatakas* also. *Shreni* was a well-known term for the merchant guilds. *Kautilya*, who lived in 400 B. C. had also described these village communities in his *Arthashastra*. In his *Valmiki Ramayana*, we hear of *Janpada*, which was a kind of federation of the numerous existence in this country at the time of Greek invasion ; and Megasthenes has left vivid impression of these *Pentdas*, as he termed the Panchayats. Chinese travellers Hieuen Tsang and Fa Hien tell us how India at the time of their visits was very productive and the people were "flourishing and happy beyond compare." An account of these panchayats during the 7th century is provided in Shukracharya's *Nitisara*. According to him, "Village was a composite whole and provided a composite leadership of management of village affairs. The *Dharmasutras* and the *Shastras* contain references to *Gana* and *Puga*, both of which denote some kind of village or town corporations. Archaeological findings also confirm the view that the system of village panchayats was prevalent in India through the centuries. These institutions continued to flourish during the Hindu, Muslim and Maratha Governments till the advent of the East India Company. They survived the wreck of dynasties and downfall of empires."² "The independent development of local Government

1. *Report of the Congress Village Panchayat Committee, 1954*, p. 9
2. S. N. Agarwal, *Gandhian Constitution for free India*.

provided like the shell of the tortoise a heaven of peace where the national culture could draw in for its own safety when political storms burst over the land.”¹ So said Mahatma Gandhi. “Long ago, how long history does not record, the Indian genius worked out the village and local panchayat. It remained our fort through many a turbulent period. Kings and dynasties fought and failed, empires rose, ruled, misruled and disappeared, but the villager’s life maintained its even tenor, away from the din of battle and the rush of rising and falling empires. We had a village state which protected the life and property and made civilized life possible.”²

Even the Committee of the Secretary of E. I. Co. reported in 1812. “Under this simple form of municipal government, the inhabitants of the country have lived from time immemorial.... The inhabitants give themselves no trouble about the breaking up and division of kingdom ; while the village remains entire, they care not to what power it is transferred or to what sovereign it devolves, its internal economy remains unchanged.” Observed Sir Charles Trevellyn, “One foreign conqueror after another has swept over India but the village municipalities have stuck to the soil like their own *kusha grass*. Scythian, Greek, Saracen, Afghan, Mongol and others have come down from the mountains ; and Portuguese, Dutch, French, English and Dane out of its seas and set up their successive dominations in the land but the religious trade union villages have remained as little affected by their coming and going as a rock by the rising and falling of the tide.”³

The village community has remained the basic unit of stability and strength. An ancient village has been described as a little republic, for each village was within its own limits autonomous and self-sufficient, governed by its own elected officers satisfying its own needs, providing for its own education, police, tribunals, all its economic necessities and functions, managing itself its own life as an independent and self governing unit.”⁴ Sri Aurobindo observed, “The free organic life of the village was founded in the system of self-governing community and it was done with such sufficiency and solidity that it lasted down almost to our own days resisting all the wear and tear of time and the inroad of other systems and was only recently steamrolled out of existence by the ruthless and lifeless machinery of the British bureaucratic system.”⁵

1. R K. Mukerjee, *Local Government in Ancient India*, p. 10.
2. Mahatma Gandhi, “Panchayat and Its Judicial Aspects,” in *Hartjan*, dated 8th Dec., 1946
3. *Industrial Arts of India*, p. 320.
4. Aurobindo, *Foundations of Indian Culture*, p. 403.
5. *Ibid.*, pp. 391-92.

The stability and sense of solidarity seen in the village Communities evoked the following remarks from Sir Charles Metcalf. “They seem to last within themselves where nothing else lasts. Dynasty after dynasty tumbles, revolution succeeds revolution ; Hindu, Pathan, Mughal, Maratha, Sikh, English are all masters in turn;

It is interesting to note that the attention of Karl Marx was also drawn to these Indian village republics. He writes in his *Das Capital*, "The small and extremely ancient Indian communities which still exist to some extent, are based upon the communal ownership of the land, upon a direct linking up of manual agricultural and handicraft and upon a fixed form of the division of labour which is adopted as cut and dried scheme whenever new communities are founded. They constitute self-sufficient productive entities, the area of land upon which production is carried on ranging from a hundred to several thousand acres. The greater part of the product is produced for the satisfaction of the immediate needs of the community, not as commodities ; and production itself is, therefore, independent of the division of labour which the exchange of commodities has brought about in Indian society as well.....In different regions of India we find different forms of such communities. In the simplest form the land is commonly tilled and its produce is divided among the members of the community, while every family carries on spinning, weaving, as an accessory occupation. The simplicity of the productive organism in these self-sufficient communities.....unlocks for us the mystery of the unchangeableness of Asiatic society, which contrasts so strongly with the perpetual dissolutions and reconstruction of Asiatic states, and with unceasing changes of dynasties. The structure of the economic elements of the society remains unaffected by the storms in the political weather."¹

Sir Henry Maine pointed out, "Indian village community was a living and not dead institution and the Indian and the ancient European systems of village communities were, in all essential particulars, identical."² Dr. Altekar has opined. "From ancientmost

but the village community remains the same. In times of trouble they arm and fortify themselves ; an hostile army passes through the country ; the village communities collect their cattle within their walls, and let the enemy pass unprovoked If a country remains for a series of years the scene of continued pillage and massacre, so that the villages cannot be inhabited, the scattered villagers nevertheless return whenever the power of peaceable possession revives. A generation may pass away but the succeeding generation will return. The sons will take the places of their fathers; the same site for the village, the same position for the houses, the same lands will be occupied by the descendants of those who were driven out when the village was depopulated, and it is not a trifling matter that will drive them out, for they will often maintain their post through times of disturbance and convulsion, and acquire strength sufficient to resist pillage and oppression with success..... all acting in a union with a common interest as regards the Government, adjusting their own separate interests among themselves according to established usage.....I, therefore, wish that the village constitution may never be disturbed and I dread everything that has a tendency to break them up"—*Minutes of Evidence taken before the Select Committee on the Affairs of the East India Company*, Vol. III, 1832, pp. 131-132, Appendix 84.

1. Marx, C, *Capital*, pp. 357-358.
2. H. Main, *Village Communities in East and West*.

times, villages in India have been the axle of administration. The position of towns in ancient Indian life was negligible."¹

The village communities in India grew out of the unsettled and inchoate conditions of early tribes and their forms of social organisation. These bodies came into existence the earliest, and even at this early stage developed a high degree of organised functioning, and came to be the real base upon which great ancient culture grew and prospered.²

The Indian villages had evolved a well-balanced social, economic and political system by eschewing the two extremes of *laissez-faire* and totalitarian control. They had developed an ideal form of co-operative agriculture and industry in which there was hardly any scope for spoilation of the poor by the rich. As Gandhiji has put it. "The production was almost simultaneous with consumption and distribution, and the vicious circle of money-lender economy was conspicuous by its absence. Production was for the immediate use and not for distant markets. The whole social structure was founded on non-violence and fellow-feeling. The gram panchayats administered the village affairs either on its own responsibility or as an adjunct to the village headman or Patel. It also administered justice and peace, maintained law and order by watch and ward, provided facilities for education, and public works such as election and maintenance of public buildings, roads, tanks, wells and the keeping of village tracts in order and providing all other common amenities, social and economic of the village life and collected and distributed charity to the needy and the poor. It derived its finances from the rich and wealthy inhabitants of the village and from other donations. The labour for the works of public utility the village community could get from the village people. In this way it was self-sufficient and self-supporting having little to do with the outside world. In the past, indeed these panchayats played a very useful role in developing the village corporate life but unfortunately the advent of the British rule in India led to their decay and disappearance.

Causes of Decay of the Ancient Institution

An extreme anxiety to enhance the land revenue to its utmost limits induced the East India Company to make direct arrangements with every individual cultivator, instead of with village community as a whole. An equally unreasonable anxiety to centralise all judicial and executive powers in their own hands led the British administrators to virtually set aside the village functionaries and, thus, deprive them of their age-long powers. These republics, therefore, fell into decay. This decay was further helped by a number of other factors.

1. S. A. Altekar, *Pracheen Bhartiya Shashan Padhati*, p. 168.

2. H. D. Malaviya, *Village Panchayats in India*, 1956, pp. 77-78.

The administration of the village by the agencies of the Central Government, the extension of the jurisdiction of the modern, civil and criminal courts of the towns, new land revenue system, increase in the means of communications, progress of education, police administration, migration of the best and ablest persons from the villages to the towns, the growing spirit of individualism and the break-up of the joint family system led to the decay and disintegration of so important an institution like the panchayats. Thus, the self-sufficient nature of the old quasi-democratic rural policy was broken and consequently the village panchayats as a rural institution sank into insignificance. As R. C. Dutta remarked, "One of the saddest results of British rule in India is the effacement of that system of village self-government which was developed earliest and preserved longest in India amongst all the countries of the earth."

"The old panchayats were informal affairs, not statutorily created but working on the basis of free will of the villagers. It met freely where and when it liked, was ignorant of the blessedness of odd numbers and decisions by majority, and was not accustomed to seeing its decision annulled by a petition sent over the heads of its members. Apparently oblivious of these failures and in their enthusiasm to lead on natives to self-rule, the British rulers passed orders and Acts for the development of self-governing institutions in the village."¹

The Royal Commission on Decentralisation (1907)

In 1896 and 1897, the Government of India adopted resolutions on local self-government, but these completely ignored the villages. However, in 1907-8 the entire subject of the local self-government was considered by a Royal Commission on Decentralisation appointed by Edward VII. The Commission recognised that "throughout the greater part of India the village constitutes the primary territorial unit of Government organisation and from the villages are built up larger administrative entities."² The report said, "These villages formerly possessed a large degree of autonomy but this autonomy has now disappeared owing to the establishment of local, civil, criminal courts, the present revenue and police organisation, the increase of communication, the growth of individualism, the progress of education, and the operation of the individual *raiayatwari* system which is extending even in the north of India. Nevertheless the village remains the first unit of administration, the principal village functionaries—the headman, the accountant and the village watchman are largely utilised and paid by the Government and there is still a certain amount of common village feeling and interests."³

1. H. D. Malaviya, *Ibid.*, p. 220.

2. *Report of the Royal Commission on Decentralisation in India*, Vol. I, 1909, p. 236.

3. *Ibid.*, p. 237.

The Commission recommended that it would be desirable to constitute village panchayats for the administration of local village affairs. It further added that "the foundation of many stable edifices which shall associate the people with the administration must be the village, in which people are known to one another and have interest which converge on definite and well-recognised objects like water supply and sanitation."¹ It visualised certain difficulties in the success of such an effort, like caste and religious disputes and factions so common in village life, or, in large estates the influence of the landlord which may prevent free action by the tenantry. It agreed that these difficulties are not insurmountable, and advise a gradual and cautious approach beginning from those villages in which circumstances are most favourable by reason of homogeneity.

The Commission recommended that :

- (1) The panchayats should be entrusted with these functions :
 - (i) civil and criminal jurisdiction of petty cases ;
 - (ii) Village sanitation and expenditure on certain minor works ;
 - (iii) Construction and maintenance of schools and some local control in respect of school management ;
 - (iv) selected panchayats to be given the management of small fuel and fodder reserves ;
 - (v) management of village cattle pounds and of markets of purely local importance.
- (2) The work of panchayat should be free from interference by the lower government subordinates.
- (3) The panchayats should not be placed under District or sub-district Boards. All matters relating to the appointment and removal of village officers should be dealt with by the S.D.O. and there should be no appeal from his orders beyond the collector.
- (4) The panchayats should not involve fresh taxation. Its revenue should be derived from these sources ; (i) special grants, (ii) the land cess : (iii) the receipts from village cattle pounds or markets which may be entrusted to its management, and (iv) small fees on civil suits filed before it.

The recommendations were implemented in a half-hearted manner. However, the Government issued a resolution on the local self-government in May, 1915, indicating the following general principles :--

- (i) Experiments should be made in selected villages or areas larger than a village, where people in general agree.
- (ii) Legislation, where necessary, should be permissive and general. The powers and duties of the panchayats—

1. Report of the Royal Commission on Decentralisation in India, Vol. I, 1909, p. 232.

whether administrative or judicial-need not be identical in every village.

- (iii) In areas where it is considered desirable to confer judicial as well as administrative functions on panchayats the same body should exercise same functions.
- (iv) Existing village administrative committees—such as village sanitation and education committee—should be merged in the village panchayats where these are established.
- (v) The jurisdiction of panchayats in judicial cases should ordinarily be permissive, but in order to provide inducement to litigants reasonable facilities might be allowed to persons wishing to have their cases decided by the panchayats, court-fees, if levied, should be small, technicalities in procedure should be avoided and possibly a speedier execution of decrees permitted.
- (vi) Power of permissive taxation may be conferred on panchayats, subject to the control of the local government, but the development of the panchayat system should not be prejudiced by an excessive association with taxation.

Montague-Chelmsford Reforms and After

With the transference of power to the local self-governments following the Montague-Chelmsford Reforms in 1919—legislations on village panchayats were passed. Thus, there were passed the Madras Panchayat Act, XV of 1920 ; the Bombay Village Panchayat Act, IX of 1920 ; the Bengal Self-Government Act, V of 1919 ; the U. P. Panchayat Act, VI of 1920, the Punjab Panchayat Act, III of 1922 ; the Bihar Self-Government Act, V of 1920 ; the M. P. Panchayat Act, V of 1920 ; and the Assam Self-Government Act of 1925. Some princely States also enacted legislation in this direction in subsequent years. Mysore (1926), Baroda (1926), Indore (1920), Cochin (1919), and Bikaner (1928).

Development After Independence

One of the Directive Principles (Article 40) of the Indian Constitution says that "the State shall take steps to organise village panchayats and endow them with such powers and authority as may be necessary to enable them to work as units of Self-government." Panchayati Raj comprehend both the democratic institutions and the extension services through which the development Programmes are executed.

Panchayats Under the Planning Period

With the dawn of freedom, the method of involving people in their own welfare in a democratic state was developed. This involvement manifested itself in the participation of the people in the selection of their representatives in the legislature of the states and the

Parliament. But this step was rather insufficient. Hence, states started through legislation to renew the old concept of gram Panchayats and Gram Sabhas so that peoples' involvement in their affairs at the grass roots can be started. This approach was reflected in the first Plan document which referred to the need of "establishing over a period of years panchayats for villages or groups of villages." The Plan said "we believe that the panchayats will be able to perform its civic functions satisfactorily only if these are associated with an active process of development in which the village panchayat is itself given an effective part. Unless a village agency can assume responsibility and initiative for developing the resources of the village, it will be difficult to make a marked impression on rural life, for only a village organisation representing the community as a whole can provide the necessary leadership. As the agencies of the State Government cannot easily approach each individual villager separately progress depends largely on the existence of an active organisation in the village which can bring the people into common programmes to be carried out with the assistance of the administration."¹

The concept of village Panchayats was added on by the Community Development Programmes started in 1952. Along with this concept it was felt necessary to build up an administrative system which can tackle the welfare problems of growth at the local level. Hence N.E.S. followed the C. D. P. But it was soon realised that the public involvement was not representative enough and as such not effective. This was reflected in the Second Plan document which emphasised on the necessity for speeding up the development of democratic institutions within a district' in which panchayats would be organically linked with popular organisations at higher levels.

The *Second Five Year Plan* observed. "The development of village panchayats on the right lines has significance for several reasons, under the impact of new developments, including the growth of population, land reform, urbanisation, spread of education, increase in production and improvements in communications. Village society is in a state of rapid transition. In emphasising the interest of the community as a whole and in particular the needs of those sections which are at present handicapped in various ways, village panchayats along with co-operatives, can play a considerable part in bringing about a more just and integrated social structure in rural areas and in developing a new pattern of rural leadership."²

The *Third Five Year Plan*, laid down that Panchayati Raj Institutions should promote the development of co-operatives and should endeavour to create a climate of community effort and social responsibility such as are vital for the successful working of co-operatives at all levels."

1. *First Five Year Plan*, p. 133.

2. *Second Five Year Plan*, p. 151.

In the Conference of State Ministers of Panchayats held at Hyderabad in 1961, it was decided that promotion of co-operation will be one of the ten point tests of Panchayati Raj. The Conference suggested the following criteria for measurement of success in this direction ; "Panchayati Raj institutions should take steps for promoting and strengthening service co-operatives within their areas as agricultural production plans can be implemented only if credit and supplies are provided by co-operatives. Revitalisation of service co-operatives should be an important task..... It should be the primary responsibility of the Panchayati Raj institutions to promote the fulfilment of the following in a progressively increasing measure so that ultimately every family is enabled to become a member, in its own right, of the village co-operative: —

(i) coverage of village co-operatives ; (ii) coverage of rural families by co-operatives ; (iii) total volume of credit given by co-operatives ; (iv) improvement in recoveries and overduees ; (v) supplies and services made available by co-operatives ; (vi) volume of produce marketed through co-operatives ; (vii) volume of produce processed through co-operatives ; (viii) organisation of artisans into co-operatives ; (ix) increase in share capital and deposits of co-operatives and small savings ; (x) progress in giving loans against production plans."

During the *Fourth Five Year Plan*, significant developments took place with respect to enactment and implementation of Panchayati Raj Acts in different States. For instance, Zila Parishads were abolished in Orissa, Karnataka and Haryana states. Similarly, the Zila Parishads in U. P. were suspended in 1970 for two years. In Assam, a new Act was enacted. The Government of Andhra Pradesh, Maharashtra, M.-P., and Gujarat got the working of Panchayati Raj examined From the experience of the functioning of these agencies in various states it could be said that by and large *status quo* had been maintained with regard to their functioning, in states like Punjab, Andhra Pradesh, Orissa, Karnataka, Rajasthan, and Haryana, the powers concerning control over the junior staff of the panchayat samitis, ceiling on expenditure and execution of minor programmes have been withdrawn. In several states, the elections to these institutions are not being regularly held."

In the *Fifth Five Year Plan*, it has been recognised that rural development should include agricultural development in its widest sense so as to embrace, besides crop production, all its allied activities. Such integrated type of development would be possible only through cooperation and participation of the people. It could be secured by strengthening the Panchayati Raj Institutions at various levels. It would be necessary to review the size and viability of gram panchayats, and panchayat samiti and zila parishad. It would be desirable that the panchayats are entrusted with the implementations

of specific programmes. Efforts will have to be made to attract institutional finance for augmenting the resources of panchayati raj bodies. It is also essential to lay down norms and criteria for viable panchayats.”¹

Implementation of the Scheme

In January 1957 a Study Team, under the Chairmanship of Shri Balwantrai Mehta, was appointed to examine the C. D. Programme. It realised the necessity of democratic decentralization of administration so as to create institutions of democratic administration at the village, block and the district level. According to this Committee, “It is very necessary that there should be devolution of power and decentralisation of machinery and that such power should be exercised and such machinery controlled and directed by popular representatives of the local area.”

The Mehta Team reported, “Development cannot progress without responsibility and power. C. D. can be real only when the community understands its problems, realises its responsibilities, exercises the necessary powers through its chosen representatives and maintains a constant and intelligent vigilance in local administration. With this objective we recommend an early establishment of statutory elective local bodies and devolution to them of the necessary resources, power and authority. It further said that “the basic unit of democratic decentralization should be located at the block samiti level.” It contemplated just an advisory role for the district tier.

Panchayati Raj, has been conceived as the process of democratic decentralization embodying all institutions of local self-government. The Committee felt that the poor record of the existing local self-governing institutions was due to the inadequate power given to them and woeful lack of funds at their disposal. It, therefore, recommended a three-tier system of decentralisation. At the grass roots in the villages were to be formed *village Panchayats*, in the middle were to be *panchayat samitis* at the block level and at the apex, *zila parishads* were to be at the district level. These new bodies were to have wide powers and adequate finance.

In this context, the inter-linked three-tier structure—*Gram Sabhas* and *Panchayats* at the village level, *Panchayat Samitis* at the block level, and *Zila Parishads* at the district level—was brought into existence, after the Balwantray Committee Scheme was approved by the National Development Council in January 1958. The N.D.C. affirmed “the objectives in introducing democratic institutions at the district and block levels and suggested that each State should work out the structure which suited its conditions best.”

With this a beginning was made with Rajasthan and Andhra Pradesh in 1959, followed by Assam, Tamil Nadu and Karnataka in 1960, Maharashtra in 1962, and Gujarat and West Bengal in 1963

1. *Draft Fifth Five Year Plan, 1974-79*, Vol. II, pp. 86-87.

and 1964 respectively. Bihar and M. P. enacted the relevant legislation in 1962.

No rigid institutional pattern was laid down for the Panchayati Raj set-up. Every State was free to work out the details of its own pattern, in the light of the local conditions and requirements subject to certain fundamentals which are ;—

- (i) A three-tier structure of local self-governing bodies from the village to the district, the bodies being organically linked up :
- (ii) Genuine transfer of power and responsibility to them :
- (iii) Adequate resources should be transferred to these bodies to discharge the responsibilities devolving on them ; and
- (iv) The system evolved should be such as will facilitate further devolution and dispersal of power and responsibility in the future.

The village panchayats are the elected bodies of the people. All adults from Gram Sabhas vote to elect panchayats. The village panchayats send their elected representatives to Block Panchayat Samitis, which functions as a link between the village panchayats and the Zila Parishads. The Samiti elects its President and Vice-President. At the district level, Zila Parishads are constituted by the President of Panchayat Samitis along with the M. Ps. and M. L. As. in the district. Each district is divided into blocks, each of which covers certain panchayat areas. In the Zila Parishad, the Collector and the technical departments of the Government offer guidance and assistance to the Block Panchayat Samitis. These Samitis are autonomous. In short, peoples' representatives at all levels—centre, states, district, block and village—are associated with the Panchayati Raj.

Objectives of Panchayati Raj Institutions

The basic objective of P.R.I. is to grant recognition of the organic inter-connection between rural development effort and popular support. The principal objectives as given in the Third Year Plan are :

- (i) Increasing agricultural production :
- (ii) Development of rural industries ;
- (iii) Fostering co-operative institutions :
- (iv) Full utilisation of local man-power and other resources—physical and financial—available to the panchayats ;
- (v) Assisting the economically weaker sections of the village community.
- (vi) Progressive dispersal of authority and initiative, with special emphasis on the role of voluntary organisation; and

- (vii) Fostering cohesion and encouraging the spirit of self-help within the community.

The Panchayati Raj now covers practically the entire country. Except for Pondicherry, Lakshadweep the village panchayats extend to all parts of India. The higher tiers of Panchayati Raj bodies have been established in all states except M.P., Jammu and Kashmir and Kerala.

As on March 31, 1977, there were 222,055 gram panchayats as against 219,892 in 1973-74 : and 117,593 in 1955-56. These covered 585, 438 villages in 1976-77 as against 544,355 in 1973-74, covering 98.9 % of the rural population (2.9,4131 lakhs) as against 97% (4068 lakhs in 1973-74). The average number of villages per gram panchayat was 2.84 and the average population per gram panchayat was 1995. For 1973-74, the respective number was 2.5 and 1,850.

Besides there were 4028 Panchayat Samities and 262 Zila Parishad as against 3863 and 201 in 1973-74.

Pattern of Panchayat Organisation

The pattern of village panchayats varies from State to State. In a number of States, *Gaon Sabhas* or (*Gram Sabhas*) have been established in every village serving a population of 1,000 or more. In areas where there are no villages within 3 miles radius of a particular village, a separate *Gaon Sabha* is established for such a village even though the population of that village is less than 1,000. If the villages are close by, they are combined to form only one panchayat, even if the population is above 5,000 e.g., there is a Gaon Sabha in every village or group of villages with a population of 1,000 in U. P., of which all the adult members residing in the area are life-time members. There are about 36,000 Gaon Sabhas in U. P., while in Tamil Nadu panchayats are to be formed for every revenue village or group of villages with a population of 1,000. Here two kinds of panchayats are formed - Class I in villages with a population of 5,000 and an estimated revenue of Rs. 10,000. In M. P. formation of panchayats is split up into three stages. First for every village with a population of 1,000: second for villages with a population between 500 and 1,000 and third, for villages with a population below 500. The principle adopted is one panchayat for one village. In Maharashtra it is obligatory on the Government to establish village panchayats with a population of 2,000 and above. For this purpose two or three villages may be combined. There is no panchayat for villages with a population of less than 1,000. In Punjab panchayats are formed for a village or group of villages with a population of 500. In Bihar panchayats are formed of a village or groups of villages with a population of 4,000 in the northern and southern districts and 2,500 in the Chota Nagpur region. In Bengal panchayats are formed in villages with a population between 500 and 10,000, whereas in Orissa they are established

in compact, selected areas with a population ranging from 5,000 to 10,000. In Mysore panchayats are established in a village with a population between 2,000 and 5,000; in Rajasthan the limit is a population of 5,000. But now they have been reconstituted so that each Panchayat will have a population of 1,500 to 2,000.

In certain other states, the panchayat raj is administered in two or three tiers, viz., *Gram Panchayat*, *Kendra Panchayat* and *Mandal Panchayat*. At the lowest level, the *primary Panchayats* or *gram panchayats* are given certain municipal function : *Kendra Panchayats* (or the combination of a certain number of gram panchayats besides these are also given certain administrative functions as well; and the *mandal Panchayats* at the district levels (which combine a few *Kendra Panchayats*) are given such functions as management of schools, dispensaries and hospitals. (refer to *Appendix* at the end.)

In still certain other states, *nyaya* or *Adalti* (Judicial) Panchayats are established by combining a few gram panchayats and establishing one court for all of them. In some other states, the State Government specifies the local limits and jurisdiction of each gram Sabha or the panchayat, while in other panchayats which cater for a population of more than thousand are divided into wards. Panchayats have as many as five or six wards and cater for a population of 5 to 6 thousand persons.

Nayay Panchayats are functioning in all the States except Assam, Andhra, Tamil Nadu, parts of Karnataka, Kerala, West Bengal and Nagaland.

The System of Elections

Election to the village bodies is direct and based on adult franchise by show of hands. The executive bodies of the Gaon Sabha constitutes the gaon panchayat. The number of members ranges from 30 to 51. Seats are reserved for the minority community and scheduled castes. Seats are allotted to each constituency in proportion to its population. In Tamil Nadu elections to Class I Panchayats are held by secret ballot based on adult franchise, while to Class II are held by show of hands. In Maharashtra the Panches are elected through secret ballot based on adult franchise. The area of the village panchayats is divided into wards each of which elects one or more members. If the required number is not returned within 8 weeks, the Standing Committee of the District Board will appoint the required number of persons. The Sarpanch is elected by members from among their own number. In Punjab, too, the election is held by secret ballot and the number of Panches varies from 5 to 9. Sarpanch is elected by the panches. While in Bihar the *Mukhiya* is elected without contest, and panches are elected by secret ballot. The Executive Committee is nominated by the *Mukhiya*. Their number varies between 7 and 15. In West Bengal the panches are elected at a general meeting of voters by show of hands. In Orissa all panchayats are formed on

the basis of adult franchise and members are elected by secret ballot. The *Sarpanch* is elected by the Panches. In Karnataka the members are elected on the basis of adult franchise either by secret ballot or by show of hands. Members below 25 years of age cannot contest. The number of members of a Panchayat varies from 10 and 20 in proportion to the population of the unit. In Rajasthan elections are held on the basis of adult suffrage by show of hands. Panchayat circle is divided into wards and each ward returns one member. The *Sarpanch* is elected by the entire electorate of the village.

It will thus be seen that panchayats are elected by Gram Sabhas consisting of entire adult population of the village.

The size of the village panchayat in terms of average number of villages and rural population per panchayat varies from one state to another, the number of villages in a panchayat being as high as 29.7 in Assam 8.3 in Himachal Pradesh and 13.3 in Orissa. The average in Kerala, Gujarat, Rajasthan, Tamil Nadu, Punjab and U. P. is between 2 and 5 villages.

In terms of population Assam tops the list, with nearly 19,474 people per panchayat, followed by Kerala with (19,403): Orissa with 5,242. In Bihar (4,706) Jammu and Kashmir, (2,463) and W. Bengal (1,678) Rajasthan (2,905), M.P (2,262), in Andhra (2,299) and Tamil Nadu (2,542) Gujarat (1,632) Maharashtra (1,503). In U.P. it is (1043).

There are variations also amongst panchayats in each state. In Tamil Nadu and Karnataka Panchayats with a population of 5,000 and with an annual income of over Rs. 10,000 have been classified as *town panchayats* and in Andhra Pradesh as notified panchayats. In Gujarat village panchayats with a population of over 10,000 and not exceeding 30,000 are known as *nagar panchayats*. Such classification is useful as these panchayats are in the nature of semi-municipalities and can afford adequate administrative staff.

Functions of Village Panchayats

The functions of panchayats in different states have a similarity though their enumeration and classification varies considerably. They are both obligatory and discretionary. For example, in Tamil Nadu they have been divided into 8 obligatory and 10 discretionary heads and in Andhra Pradesh 12 obligatory and 27 discretionary. In Punjab, 27 functions have been made obligatory and 7 discretionary. In Maharashtra, Kerala, Karnataka, Rajasthan and U.P. a large number of functions under each head, like agriculture, animal husbandry, education, health etc., have been listed.

- (i) *Obligatory Functions.* Opening and maintenance of burial grounds; maintenance and improvement of public streets; drains, lighting, medical relief; taking curative and preventive measures in epidemic; maintenance and construc-

tion of public latrines: registration of births and deaths, sanitation and conservancy; organisation of *melas* and fairs and management and care of common grazing grounds; provision of primary education; water supply, etc.

- (ii) *Discretionary Functions.* Plantation of trees; improving the breed of cattle; organisation of village volunteer force for watch and ward of the village and the crops; development of co-operation and land reforms; promotion and improvement of cottage industries; relief against famine; construction of new bridges, *dharamshalas* and culverts, wells and ponds; improvement in sanitation, veterinary and medical facilities; maintaining libraries and reading-rooms; establishment and maintenance of child welfare centres; control and management of village forests; organisation, supervision and control of rural development or multipurpose co-operative societies; filling in of insanitary pits; establishment of improved seed and implement stores; maintenance of stud-bulls, schools and hospitals, crop experiments, etc.
- (iii) They also collect taxes, cesses, fees and other dues for the government; regulate dangerous trades and practices; organise recreational and social functions and take up any other work of public utility.
- (iv) *Economic Functions.* In addition to the useful functions enumerated above, some of the panchayats have also been allotted functions of an economic nature like land reforms, promotion of co-operation, consolidation of holdings, collection of vital statistics and maintenance of land records.
- (v) *Other Functions.* They have been very useful in certain other spheres of services, too, e.g., they have been of special service for maintaining dispensaries in villages as in west Bengal; for supplying electricity and for enforcing a Town Planning Act in rural areas of Tamil Nadu; for spreading adult education in Rajasthan, U. P., M. P. and Assam; for introducing agricultural improvements in the Punjab and Karnataka for giving effect to social legislation such as the Marriage Registration Act, the Marriage Expenses Controlling Act in M. P. for developing village libraries, provision of rural water supply and planting of trees in Rajasthan.
- (vi) *Judicial Functions and Nyaya Panchayats.* Besides, these functions, some of the village panchayats have also been entrusted with judicial powers. These relate to the trial of civil suits for money due on contracts, recovery of movable property or its value. Their powers of punishment are limited to the imposition of moderate fines, and they employ simple and summary procedure for the disposal of

cases. They have also been given limited powers under the Civil Procedure Code.

Panchayat Committee of Local Self-Government Ministers' Conference, 1954¹

The Panchayat Committee of the Local Self-Government Ministers' Conference, 1954, recommended the formation of Nyaya Panchayats for the area comprising 4 to 5 village panchayats. According to this Committee, "Each Panchayat should elect five persons to serve on the N.P., and if the five Panchayats comprising a group elect 5 such persons each to serve on the N. P. a total of 25 persons to serve on the N. P. would be obtained. These 25 persons should again be divided into 5 groups of 5 persons each. Each of these 5 groups should function as Panchayat Court, administering judicial functions alternatively.....More and more powers to try criminal cases and civil and revenue suits should gradually be delegated to Panchayat Courts and that enhanced civil and revenue powers might be given to such courts if the parties agree to refer their cases for arbitration to those courts. These courts should also be authorised to undertake amicable settlement of civil or revenue disputes referred to them by the parties to such disputes."

1. The Panchayat Committee of the Local Self-Government Ministers, Conference, recommended that generally following items may be taken as illustrative functions which might be entrusted to the Panchayats:
 - (a) *Municipal and Welfare functions.* (1) registration of births, deaths and marriages, (2) medical relief, including maternity and child welfare dispensaries, hospitals, etc., (3) general sanitation of the entire area including taking of preventive and curative measures against outbreak of epidemics, (4) regulating places for disposal of dead bodies of human beings, animals and other offensive matter, (5) disposal of unclaimed corpses of human beings, animals, etc., (6) construction and repair of drinking water wells, public washing and bathing ghats and regulating sources of supply of drinking water including piped water supply where possible, and prohibition of bathing, washing etc., in any public water supply sources set apart for drinking, (7) regulating, cleaning, removal and disposal of sullage, sewage, etc., including sale of manure therefrom, (8) regulating the construction of latrines, urinals, water closets, drains, etc., with power to remove, alter, repair, cleanse and disinfect the above mentioned including cess pools, (9) cleanse, repair, remove, cover, fill-up drain or deepen or to remove water from a public well tank, pool, etc., as a preventive public health measure, (10) clear any vegetation, undergrowth, shrub or jungle for the same purpose, (11) construction and maintenance of slaughter-house, (12) veterinary relief, (13) management and control of cattle pounds, (14) construction, repair, maintenance, sanitation and lighting of public streets pathways, lanes, etc., (15) power to prevent encroachment on public streets and public places including hedges and to remove trees or branches of trees obstructing any public thoroughfare or causing public inconvenience, (16) construction of roads, building of bridges, culverts, etc., between villages under their control including approach roads to highways and installation of public road stands, (17) planting of trees on roadsides and other places, and and afforestation on wasteland to prevent erosion, (18) establishment of libraries, reading rooms, recreation grounds,

Finances of Panchayats

Nearly every panchayat has a village panchayat fund to which are credited all allotments, general and special contributions and donations from the Central and local governments, municipalities, district boards.

The village panchayats derive their income from five main sources :—

- (i) *Taxes.* All Panchayat Acts provide for levy of taxes by panchayats. In certain states, some taxes are obligatory and others are optional. In Assam, Gujarat, Jammu and Kashmir, U. P., Rajasthan, all taxes are optional. *House tax* is compulsory in Andhra Pradesh, Kerala, Maharashtra, M.P., Tamil Nadu, Karnataka and Punjab. In these states, except Maharashtra and Punjab, *profession tax* is also compulsory. *Vehicle tax* is compulsory in Kerala and Tamil Nadu. In some districts of Andhra Pradesh, *Kolagaram* or *Katarusum tax* is levied compulsorily on the village produce sold in village by weight, measurement or number. *Octroi* has been provided in Karnataka, Gujarat, Maharashtra and Rajasthan. *Pilgrim tax* is leviable, at the option of panchayats in Rajasthan, Bihar, Gujarat, Maharashtra and J. and K. *Animal tax* is levied in J. and K. Certain states also levy *land cess* and *entertainment tax*. Other taxes are : tax on agricultural land, pilgrim tax, taxes as fairs, festivals and entertainments, taxes on cattle, taxes on transfer of property, tax on commercial crops, sanitary tax, drainage tax, lighting tax, water tax, tax on fisheries, etc.

children's parks, etc. (19) establish, maintain and supervise one or more primary middle or high schools. (20) regulating construction of new buildings and existing buildings (21) organisation and regulation of fairs and markets, (22) organisation and regulation of melas, festivals, community festivals, etc., (23) extension and development of "abadi" villages sites, (24) watch and ward of the village including crops therein. (25) assistance and care of crippled destitutes, blinds, etc., (26) construction and maintenance of *dharam shilas*, (27) rendering assistance in extinguishing fires including maintenance of fire fighting equipment and personnel where possible (28) encouraging youth organisations.

- (b) *Development Functions.* (1) Crop experiment, (2) improvement of agriculture, (3) formation of co-operative thrift and credit societies and multipurpose co-operative societies, (4) organisation of co-operative farming and joint farming, (5) improvement of cattle breeding and general care of livestock, (6) establishment of common granaries, (7) promotion and development of cottage industries, (8) promotion of village and cottage industries.

According to the Second Five Year Plan, the functions of the Village Panchayats are divided into two groups : viz., (i) *Administrative functions*, among which are included the (a) civic, (b) development, (c) land management, and (d) land reforms functions, and (ii) *judicial functions*.

- (ii) *Different Types of Fees.* Fees and rates are classified into : (a) *fees for services*, such as for water supply, drainage, street lighting and conservancy ; (b) *licence fees* are levied on professional buyers, brokers and commission agents, and for (c) registration of cattle sold, collection of hides and skins, tea stalls, and restaurants or goods exposed for sale in markets, for erection of new buildings, factories and workshops, cart stand, for use of common land and community property and for carrying on dangerous or offensive trade ; on fishing in fisheries; fees on sarais, rest houses and camping grounds (d) *Fines and penalties* are levied for encroachments, failure to take licence, and unauthorised possession or dealing in prohibited articles, etc.
- (iii) *Communal Income.* This includes income from fisheries, fairs and markets, grass sales, usufruct and windfall of trees, withered and wind-fallen trees, cattle dropping and other rubbish, donation of land, money, shramdan for public utility works, panchayat forests, government or communal property.

(i) *Administrative Functions*

- (a) The civic functions of the Panchayats include such tasks as village sanitation, registration of births and deaths, etc., organisation of village watch and ward, construction, maintenance and lighting of village streets, etc.
- (b) The functions of Panchayats in relation to development include ; (i) farming of programmes of production in the village ; (ii) in association with co-operatives, framing budgets of requirements for supplies and finance for carrying out programmes ; (iii) acting as a channel through which the increasing proportion of Government assistance reaches the village, (iv) developing common lands such as wastelands forests, *abadi* sites tanks etc., including measures for soil conservation ; (v) construction, repair and maintenance of common village buildings, public works, roads, tanks ; (vi) organisation of mutual aid and joint effort in all activities, (vii) promotion of co-operative societies ; (viii) organising voluntary labour for community work ; (ix) improvement of livestock ; and (x) promoting small-saving
- (c) The land management functions include ; (i) regulation of the use of common lands, (ii) cultivation of land set apart for the benefit of the village community, as in consolidation of holdings ; (iii) adaptation of standard, of good management and cultivation to local conditions and their enforcement, (iv) association with the work of maintenance of land records.
- (d) The function of the Panchayats in relation to land reforms consist of : (i) determination of land to be allowed to owners and tenants on the exercise of rights of resumption for personal cultivation ; (ii) determination of surplus lands on the application of the ceiling on agricultural holdings ; and (iii) redistribution of surplus lands arising from the imposition of ceilings.

(ii) *Judicial Functions*

The judicial functions of the Panchayats concern (i) the administration of civil and criminal justice ; (ii) enforcement of minimum wages for agricultural workers ; and (iii) simple disputes pertaining to land.

- (iv) *Miscellaneous.* This head comprises of interest and deposits, government assistance, stamp duty, sale of old articles, news-papers, rent and product of land, loans and advances and district board contract work.

The mobilization of local resources through taxation by the panchayati raj institutions on their own has increased from about Rs. 10.5 crores in 1961-62 to Rs. 22.54 crores in 1965-66 and to Rs. 34.20 crores in 1969-70 to about Rs. 48.61 crores in 1973-74 and to Rs. 113 crores in 1976-77.

Income of Panchayati Raj Institutions from Taxes (Rs. in lakhs)¹

Year	P. Samities	Zila Parishads	Gram Panchayats
1969-70	774.62	330.72	2182.21
1970-71	1073.74	192.71	2192.66
1971-72	1122.77	207.06	2199.98
1972-73	1161.44	128.51	3491.76
1973-74	1737.84	584.00	2629.39
1974-75	1590.75	106.56	1965.76
1975-76	1375.74	112.51	2508.99

In spite of a wide field open for raising resources, panchayats usually suffer from want of funds. "The general experience has been that the total income of the village panchayats is far from adequate to give them a firm foundation. The fact is undeniable that they suffer from shortage of funds."²

The Balwant Ray Mehta Team, therefore, suggested that, "In all States, panchayats should have power to levy special tax based on land revenue, house tax or on some other basis of executing specific development projects. Besides, efforts should be made to execute a scheme by voluntary contributions of labour or money. If these contributions are not adequate, resort may be had to labour bank, labour tax or special levy payable in cash on labour. The voluntary contribution may be adjusted towards these levies. It is essential that the people should not be burdened by too many demands—voluntary, compulsory or both. At the same time it has to be remembered that the conversion of idle labour into useful public asset is one of the most promising lines of development of our villages."

1. Ministry of Agriculture and Irrigation, *Annual Report of the Department of Rural Development, 1974-75*, pp. 113-118; *Ibid.*, for 1977-78, pp. 108-109
2. *Report of the Congress Village Panchayat Committee, 1954* p. 47; Also *Study Team Report on Panchayat Raj Finance, 1963*; H. D. Malviya, *Op. Cit.*, pp. 788-789 (Table No. XIV),

Asoka Mehta Committee observes in this connection :

"For discharging the developmental responsibilities entrusted to PRI the State governments should make available the commensurate funds from its total budget on a continuing basis. The non-plan expenditure pertaining to the decentralised items will be administered by the Zila Parishad. *The financial devolution must correspond to the functional decentralisation.* Apart from the budgetary devolution the PRI should also mobilise enough resources of their own. In addition to taxes, PRI should levy fees/taxes for services like lighting, sanitation, water supply etc. The maxima and minima of these fees should be laid down to avoid arbitrariness or lack of uniformity..... Land revenue cess or land revenue, cess on water rate, surcharge on stamp duty, entertainment tax and show tax etc. should also be assigned to the PRI with higher percentage to Mandal Panchayats..... A permanent annual grant of not less than Rs. 2.50 per capita should be available to the Mandal Panchayats, the total expenditure on this account may not be more than Rs. 125 crores to buttress the tax as well as non-tax receipts of mandal panchayats... On the basis of 1977-78 data, the quantum of funds available to the PRI should be over Rs. 2,500 crores of the total Plan and non-plan development budget expenditure which could amount to Rs. 6 crores per district."

Administration of Panchayats

In all States, adequate provision is made in the Act for the control of panchayats. In judicial matters its functions are controlled by a competent authority with power to quash its proceedings to sense its decisions, to withdraw or transfer cases to the higher courts and in the last resort to cancel the jurisdiction or to supersede it.

The administrative control of the panchayat is in some cases entrusted to the Government agency from a Tahsildar to the Collector or Commissioner. While in others to superior local bodies like the local or district boards e.g., in U. P. the District Magistrate, the District or Planning Officer and Assistant District Panchayat Officer exercise powers of supervision and control over the working of Panchayats. The District magistrate has the power to suspend any member of a gaon or nyaya panchayat if he has failed to discharge his duties properly ; while in Tamil Nadu there is a separate department of the government, viz., the Inspector of municipal councils and local boards and regional inspector to supervise and co-ordinate the administration of all the panchayats, district boards and municipalities in the State. In M. P. *janapada sabhas* have been

1. *Report of the Committee on Panchayati Raj Institutions*, 1978, pp. 125-127.

established and they are responsible for the efficient and proper working of the panchayats. Supervision and control over them also vests in the *janapada sabhas*. The directorate of social welfare is responsible for the proper working of panchayats who can recommend to government for suppression of panchayats for their negligence and inefficiency. In Maharashtra there is no separate department exclusively for village panchayats but there is a separate local self-government department for all local bodies. The district collector checks and supervises the activities of the panchayats. He has powers to dissolve or supersede a panchayat and appoint an administrator. In the Punjab there is a separate panchayat department. There are also district boards in rural areas and there is every cooperation with panchayats. In Bihar the district magistrate, the district judge and the sub-divisional magistrate have powers to inspect the judicial records of the kutchery ; while a gazetted officer or chairman of the district board can inspect the office of the gram panchayats. In each district there is a panchayat officer. In West Bengal, as panchayats are not statutory, government do not exercise the control over sanction of expenditure from revenue on account of welfare schemes. The local self-government department of the government looks after the existing panchayats and the district magistrate ensures that election of panchayat members is held according to executive orders of the government. In Rajasthan, there is a separate panchayat department. The chief panchayat officer works under the direct supervision and control of the Government, the supervision and control of the activities of the panchayats vest in the local self-government department. The panchayat department possesses powers of superseding a panchayat. It is superseded only in case of incompetency, default or abuse of power.

A bird's eye view of how Panchayati Raj Institutions have fared in some states would provide valuable insight into the structural and operational aspect of Panchayati Raj it may be stated as a general provision that in a country of India's size and diversity, certain awareness in performance is inevitable. Historical vicissitudes further complicate the picture. Structure and functions have been changing over the years. In Assam, there have been shifts in the ties and functions assigned, the prevalent ones are Mokhuma Parishad at the sub-divisional level and the panchant with a population of well over 15,000. In Andhra Pradesh, the Zila Parishads, endowed with limited executive functions, have shown encouraging results in areas like education ; the performance of Panchayt Samitis too has been noticable. In Bihar, the Zila Parishads were introduced only in 8 districts, but were soon given up. In Rajasthan which, with Andhra Pradesh, was the first to introduce Panchayati Raj the samiti ties worked with enthusiasm in the initial phase. Tamil Nadu and Karnataka do not have the Zila Parishad, in the sense of a body endowed with executive functions, but the Samitis/Taluka Board there have done well, the performance of the Samitis in Tamil Nadu in regard to education, water supply roads and nutrition has

received wide appreciation. In Kerala, where there were only village Panchayats but of a size which could amount to half a block, the working has been extremely satisfactory in the field of many municipal and civic functions, it is worth noting that, in spite of different political parties being represented on the elected body, there was the needed harmony in implementing the programmes assigned to them as also in monitoring certain development projects. In Uttar Pradesh, a large number of small Panchayats were set up together with Zila Parishads with very limited powers. They could not achieve much owing to extreme paucity of powers and resources. In Madhya Pradesh, the Act embodying the scheme of democratic decentralizations, was sought to be implemented in a piecemeal manner; an approach that proved counter productive. As far as West Bengal is concerned, it has weaned away from what seemingly was a four tiered structure to a three tiered one with large Gram Panchayats. Deviating from the Balvantray Mehta report, three tier structure with the first point of decentralization at the district level, was organized in Maharashtra and Gujrat and it has functioned effectively particularly in the field of decentralized planning and development. The District councils in North Eastern India have featured which are worth studying.

CRITICAL APPRAISAL OF THE WORKING OF THE PANCHAYATI RAJ

Beneficial Effects

Panchayati Raj Institutions have involved in programme planning, in supply and distribution of agricultural inputs, farm equipments (such as tractors, sprayers, pump sets) constructed tanks *bandharas*, small embankments and other minor irrigation works established school and primary health centres; constructed roads, and provided drinking water supplies; provided subsidies on seeds and pesticides where new varieties are being introduced; encouraged the use of improved agricultural practices through demonstrations; organised crop competitions and collected taxes to the tune of Rs. 40.00 crores in 1976-77.

The Survey entitled "Awareness of C. D. in Village India," (1966) carried out by the National Institute of C.D., Hyderabad, has stated that "the system of decentralised democracy had fostered the emergence of new leadership in the rural areas and that the elected representatives were generally better than old traditional leaders. Social welfare and increased agricultural production were the most important purposes served by Panchayati Raj."

The Survey further added that "the most heartening finding has been that it has found a niche in the minds of rural people. The leadership of Panchayati Raj bodies at the block and district levels has thrown up new challenges to the political elite operating at the State and Central levels."

Under favourable conditions Panchayati Raj Institutions have encouraged the intelligence, self-reliance, initiative and social sense of free men by placing the ultimate responsibility for government on the citizen themselves. It makes authority a trust, ensures equal consideration for all and thus makes for a just social order. Panchayati Raj has done this to a considerable extent and can do much more.

Asoka Mehta Committee has observed "It will be wrong to think that Panchayati Raj should be viewed as a god that has failed. It has many achievements to its credit, the more important of these are : Politically speaking, it becomes a process of democratic seed-dulling in the Indian soil making an average citizen more conscious of his rights than before. Administratively speaking, it bridged the gulf between the bureaucratic elite and the people. Socio-culturally speaking, it generated a new leadership which was not merely relatively young in age but also modernistic and pro-social change in outlook. Finally, looked at from the developmental angle, it helped rural people cultivate a development psyche."¹

However, the common theme of the reviews and studies undertaken has been not that the Panchayati Raj system has failed but that it could be made more effective.

Weaknesses of the System

Certain deficiencies do exist in the working of the system. Among these may be mentioned the following as the most important:

- (1) There is to be found factions among the villagers which make the common acceptance of the decisions of the panchayat impossible. Faction also makes it impossible for a common mind to develop within the panchayat and decisions are coloured by the factions interests of the members.
- (2) Lack of proper leadership in the village so that the panchayat becomes a tool in the hands of irresponsible elements in the village population. No respect is possible to develop among the villagers for an institution which is so abused.
- (3) Too much political interference in the work of the development functionaries has distributed the development work and prevented qualified and competent persons from coming forward to work in these institutions. The emerging semi-enlightened local leadership considers positions in the panchayats as more a matter of prestige, patronage and power than of service to the community. There has been interference in every party matter of administration by the elected leaders converting every development scheme into an opportunity to distribute favours among the

1. Report, p. 8.

members of their own caste, class and group. Political interference has been felt in the matters of location of service agencies." It has been expected that panchayati raj would primarily be a development mechanism and make up for the shortfalls of the community development programme..... In practice it has emerged as a power mechanism."¹

- (4) The fruits of developments, whatever achieved so far, have not been equitably distributed among the rural people. They have all been pocketed by a few well-off, landed and normally high caste inter-related families in each village. The weakest and the loneliest and the last has remained in the same conditions as even before. Instead of preparing the ground for social equality and justice, these institutions have institutionalized injustice, favouritism and factionalism in life.
- (5) The objective of the promoters of PRI to transfer effective authority to elected local institutions and to use them as effective instruments for rural developments, seems to have been frustrated. Infact one finds that "the old myth of collectors responsibility for any and every function of government in the district has not only been retained but also further reinforced."² This has reduced the role of PRI to the minimum, in developing rural areas, converting them into mere agents of State Government.
- (6) Panchayats are often under the overpowering influence of the big landlords or moneylenders in the village and, therefore, fail to inspire confidence among the majority of peasants in the village. Further, the powers that are parted with by the state governments in favour of the village panchayats with a view to training the villagers in the art of self-government are always usurped by this small group. The interests of the small minority are served at the cost of the needy majority. Thus, the main ideal of democratic training and exercise of local power for the benefit of the people gets frustrated. Instances have been common where the subsidies given for the village roads or sanitation were spent on the roads in front of the houses of this small group or in the sanitary and ugly sports only near them were attended to while the rest of the village was neglected. Sometimes the funds disappear altogether but the villager cannot dare to ask the explanation of the small group. The villager is loath to court trouble on account of the very scant protection given to him by the distant Central

1. Mathur, M. V. (Ed) *Panchayati Raj in Rajasthan*, p 180.

2. Muttalib M. A. "Decentralisation of Integration" in *Local Government Institutions in Rural India* p. 162.

Government and also because he is lost in toil and care for his daily bread.

- (7) The financial resources of the panchayats are very meagre so that they can never hope to look after even the elementary functions assigned to them. Government subsidies go only a little way towards removing this want. Some local works have to be left out on account of their heavy cost in spite of their urgent necessity.

Shortage of financial resources has adversely affected their performance in the field of development. "Slowly members of these bodies have come to realise that they have very little scope for decision making or administrative innovation and this has resulted in progressive loss of interest in planning and development and greater concentration upon petty administration matters such as posting and transfers or grant of licenses or contracts."¹

- (8) Village production plans are nothing but paper plans casually prepared by the V L. Ws. in consultation with a couple of village elders and the Sarpanch of the village panchayat. No serious attempt has been made to prepare an authentic village production plan incorporating production targets for each crop and for every family in the village.

The Fourth National Convention of the All-India Panchayati Raj (Bangalore, 1964) observed that, "the progress of the movement of democratic decentralisation is painfully slow and there has been a lack of promptitude in the implementation of plans. Lukewarm interest shown by the people, casteism and communalism, poor leadership, unwillingness of panchayats to impose taxes, lack of self-reliance and increasing dependence on state governments, bickerings and factionalism, corruption and manipulation of accounts, continuation of the old district board attitude, emphasis on desk at the cost of the real field work, bureaucratic approach and lack of guidance from superior authorities, and the habit of the *panches* to ignore people are some of the causes explaining the unsatisfactory state of affairs."

SUGGESTIONS FOR IMPROVEMENT

In order to make the panchayats more useful and to enable the people to exercise effective control over their representatives it is necessary that :—

- (i) The life of the local bodies is of shorter duration as against the life of the state legislature or the parliament. A life of two years would perhaps be the ideal one because longer life of the institutions concerned with planning and execution tends to create a sense of com-

1 Swarup, Anand, "Panchayat Raj and Local Development in Local Government Institutions in Rural India" by Haldipur and Paramhansa, 1970, p. 153.

- placency among members and makes them inactive and unresponsive.
- (ii) The *panchayat samities* could also have amongst its members those who are not directly responsible for planning and execution of the schemes at the village level, say one for a population of 10,000 who are directly elected by the people. This is because men saddled with responsibilities develop certain attitudes and become professional defenders of the programme.
 - (iii) Training programme should be drawn up. The idea being that in the period of 2 to 3 years every member of the panchayat samiti should undergo an intensive training of 15 to 20 days—the first ten days being devoted to the general training with special reference to planning co-ordination and administration. The remaining days to be devoted to training in subjects like agriculture, animal husbandry, co-operation, public health, etc. This will help Panchayat Samiti to select members for its various functional committees also.
 - (iv) Informal meetings once or twice a fortnight of the elder village men should be encouraged where the representatives of the Panchayat and these people could meet and informally discuss their problems. This will enable the people and the representatives to understand each other's view point and will also enable the people to influence the decisions of the institutions.

ASOKA MEHTA COMMITTEE AS PANCHAYATI RAJ INSTITUTIONS

This Committee was formed in December 1977 to go into various aspects of PRI with a view to promoting rural development, and to suggest measures to strengthen these institutions so as to enable a decentralised system of planning and development to be effective. It was set up under the chairmanship of Shri Asoka Mehta and 12 other members.

It submitted its Report in August 1978.

The report covers about 300 pages, and has the following sections : panchayati raj review and evaluation ; dynamics of development ; panchayati raj : an imperative : structures ; composition and elections ; functions ; planning ; weaker sections : administration ; financial resources ; human resources development ; linkage with other institutions and approach and recommendations.

Its main findings are :

A number of developments in the past has conspired to undermine the Panchayati Raj structures and made them ineffective. These factors are :

- (a) Lack of opportunity given to the PRIs (except in Maharashtra and Gujarat) for taking up planning or implementation work on a sizeable scale. Only the miniscule programmes, which were assigned to village panchayats or which were the part and parcel of the C. D. P. were handed over to the RPI. Schemes like SFDA, DPAP, ITDP were not brought within the purview of the elected Zila Parishads. Further, in the process of implementation of the transferred activities, a number of orders and directions by the State Government led to the grade, development of subsidiary legislation which curtailed the decision making powers of the elected bodies. The tapering off the Plan allocation resources and the quantum of own resources were not properly utilized by the PRI.

Again the will for strengthening the PRIs also weakened with the demands of development programmes being kept out of its orbit.

- (b) Bureaucracy had its own role in dissociating the PRIs from the developmental process. The officers feel that they are primarily accountable for results and financial proprieties to the state government. They therefore are often averse to PRIs being entrusted with additional functions and would also not easily adjust to working under the supervision of elected representatives.
- (c) The lack of clarity in regard to concept of Panchayati Raj itself and the objectives for which they should stand have also attributed to the failure of the institutions. Some treat it just as an administrative agency ; others as an extension of democracy at the grass root level : and still others as a charter of rural local government.
- (d) PRIs are dominated by economically or socially privileged persons of society and have as such facilitated the emergence of oligarchic forces yielding no benefits to weaker sections.
- (e) The performance of PRIs has also been vitiated by political factionalism, rendering developmental trusts either warped or diluted. Corruption, inefficiency, scant regard for procedures, political interference from day to day administration, parochial loyalties, motivated actions, power concentration instead of serious consciousness—all these have seriously limited the utility of Panchayati Raj for the average villager.
- (f) Since planning and implementation being a matter of expertise, require quick as well as complex arrangement of details, and as such the inter-position of Panchayati Raj bodies has on the one hand adversely affected the pace of development administration and on the other has further complicated the problems of coordination.¹

1. Report—*Ibid*, pp. 4-7.

The committee has favoured open participation of political parties in Panchayati Raj affairs as this may "ultimately convert their mutual competition into constructive co-operation, for rural development". It has suggested that a district level is the obvious choice for being treated as the first point of decentralisation below state level. The need for an institution to provide popular participation and supervision in the management of new demands of development emerging in the context of growth centres, which require local level programming has also been underlined. It envisages 'mandal panchayats, consisting of a cluster of villages and covering a population of 15,000 to 20,000. It has thus favoured a two-tier system of Panchayati Raj.

In its report embodying 100 and odd recommendations, the committee has called for greater attention for the welfare of the weaker sections. To protect and promote their interests, the committee has called for reservation of seats for scheduled castes and scheduled tribes on population basis. The funds earmarked for their welfare must be subjected to social audit by a district level agency as well as by a committee of legislatures in which scheduled castes and scheduled tribes. MLAs have a majority of representation.

The committee envisages 'a social justice committee of the zila parishad to ensure that panchayati raj institutions take interest in the welfare of weaker sections. It has emphasised that 'unless the state governments devolve corresponding plan as well as non-plan funds commensurate with the decentralisation of functions, the scheme of decentralised democratic management would not work.'

The committee has expressed the hope that its recommendations would go a long way in the effective management of rural development.

Appendix 1
Illustrative Functions for the Three Tiers of Panchayati Raj Structure

Panchayat Samiti/Taluka Board	Zila Parishad	Mandal Panchayat
<p>I. Functions assigned by Zila Parishad in the decentralised sector e. g. rabi, kharif, pig, farms, minor irrigation health, dispensaries, water supply, rural roads, Tube-wells.</p> <p>II. Preparation of Block plan.</p> <p>III. Coordination or dovetailing of panchayat works where the programmes cover more than one panchayat or taking up directly till they develop capacities.</p> <p>IV Administrative</p>	<p>I. Programme implementation of transferred functions as below :</p> <p>(a) Agriculture except research of universities.</p> <p>(b) Animal husbandry and veterinary services.</p> <p>(c) Fisheries ; (d) forestry ; (e) Marketing ; (f) irrigation (g) Health and family welfare ; (h) education ; (i) Public health engineering ; (j) Communication ; (k) Industries, (l) Urban development, (m) Welfare of backward classes.</p> <p>(n) Social welfare.</p> <p>II Planning, review, monitoring and evaluation.</p> <p>III Coordination.</p> <p>IV Administrative and those flowing from organic linkages.</p>	<p>I. Implementational :</p> <p>(a) Fodder development activities with subsidised fodder cultivation.</p> <p>(b) Land shaping in the command area or water management demonstrations.</p> <p>(c) field channels demonstration</p> <p>(d) farmer's training.</p> <p>(e) multiple cropping pattern demonstration.</p> <p>(f) demonstration of drainage-cum-recycling programmes.</p> <p>(g) minikit distribution.</p> <p>(h) pisciculture, demonstration.</p> <p>(i) facilities for creation of coastal or brackish water fishery development</p> <p>(j) fisheries propaganda and fairs.</p> <p>(k) rural housing and allotment of house sites for landless.</p> <p>(l) soil conservation schemes</p> <p>(m) farms forestry</p> <p>(n) assistance to handloom weavers.</p> <p>(o) establishment of mulberry farms.</p> <p>(p) tassar collection or rearing projects</p> <p>(q) assistance to handicrafts with improved tools marketing.</p>

- (r) Health sub-centre construction.
- (s) Recruitment and looking after rural health workers.
- (t) Running adult literacy classes.
- (u) SFZA—identification and payment of subsidies.
- (v) Rural and link roads and culverts construction.
- (w) Family welfare projects

II Promotional

- (a) Organisation of literacy centres, Balwadis, youth clubs, Mahila Mandals, voluntary organisations.
- (b) Cooperation.

III Procedural

- (a) Control of fairs and festivals.
- (b) Registration of births and deaths.
- (c) Construction and maintenance of *dharamshalas* and *sarais*.
- (d) Opening and maintenance of public markets and slaughter houses.

IV Municipal and civil works at village level.

- (a) Water supply
- (b) Health and Hygiene.
- (c) Lighting.

Appendix 2
State-wise position in regard to three or two tier system of Panchayati Raj and Legislation enacted

Sl. No.	Name of State/U.T.	No. of tiers constituted	Legislation enacted	Remarks
1.	Andhra Pradesh	Three	Yes	Panchayati Samitis and Zila Parishads have been placed under special officers.
2.	Assam	Two	Yes	Gram Panchayat and Mohkuma Parishad at Sub-Divisional level.
3.	Bihar	Three	Yes	Three-tier Panchayati Raj established in only 8 districts out of 31 districts. In the remaining 23 districts only Gram Panchayats have been constituted.
4.	Gujarat	Three	Yes	—
5.	Haryana	Two	Yes	Zila Parishads have been abolished.
6.	Himachal Pradesh	Three	Yes	—
7.	Jammu and Kashmir	Only Gram Panchayats	Yes for Gram Panchayats only	The State Government has taken steps to revitalise Gram Panchayats.
8.	Kerala	do	do	The District Administration Bill, 1971 providing for two-tier of Panchayati Raj has been introduced in the State Assembly.
9.	Madhya Pradesh	Two	Yes	Though the Legislation for higher tiers had been enacted during 1962, Zila Panchayats at the district level are yet to be established.
10.	Maharashtra	Three	Yes	—
11.	Manipur	Only Gram Panchayats	Yes for Gram Panchayats	A new legislation for setting up two-tier system is under consideration

12. Karnataka	...	Two	Yes	Zila Parishads do not exist.
13. Nagaland	...	—	—	There is no Panchayati Raj set up. Instead they have area, range and tribal councils.
14. Orissa	...	Two	Yes	Zila Parishads have been abolished in 1968
15. Panjab	...	Three	Yes	
16. Rajasthan	...	Three	Yes	—
17. Tamil Nadu	...	Three	Yes	—
18. Tripura	...	Only Gram Panchayats	Yes for Gram Panchayats only	
19. Uttar Pradesh	...	Three	Yes	Zila Parishads have been superseded.
20. West Bengal	...	Four	Yes	A four tier Panchaati Raj system obtains in West Bengal viz., Gram Panchayats, Anchal Panchayats, Anchalik Parishads and Zila Parishads. The West Bengal Panchayat Bill, 1973 for introduction of three tier system has been passed by the State Legislative Assembly.
21. A & N Island	...	Only Gram Panchayats	Yes for Panchayats only	—
22. Arunachal Pradesh	...	Three	Yes	—
23. Chandigarh	...	One	Yes	—
24. Dadra & Nagar Haveli	...	Two	Yes	—
25. Delhi	...	Only Gram Panchayats	Yes for Gram Panchayats only	Varishta Panchayats are advisory bodies.
26. Goa, Daman and Diu.	...	do.	do.	—

(Report of the Department of Rural Development for 1977-78 pp. 92-103.)

Appendix 3
Coverage of Gram Panchayats

State/U.Ts.	No. of Gram Panchayats	No. of Villages Covered	Rural Population Covered (lakhs)	Percentage of Rural population Covered by Gram Panchayats	(As on 31st March 1977)	
					Average Number of Villages per Gram Panchayats	Average Population per Gram Panchayat
1. Andhra Pradesh	10610	29131	368.00	100.00	1.82	2299
2. Assam	663	19733	129.11	100.00	29.76	19474
3. Bihar	10778	77967	507.19	99.0	7.23	4706
4. Gujarat	12787	18697	208.68	100.00	1.46	1632
5. Haryana	5040	6690	82.64	100.00	1.33	1640
6. Himachal Pradesh	2034	16916	32.13	100.00	8.32	1582
7. Jammu & Kashmir	1482	7427	36.50	100.00	5.01	2463
8. Karnataka	8411	29117	225.00	100.00	2.46	2675
9. Kerala	974	1334	188.99	100.00	1.37	19403
10. Madhya Pradesh	12770	70214	340.00	97.0	5.50	2262
11. Maharashtra	23229	35778	350.79	99.5	1.53	1503
12. Manipur	221	581	6.0	76.0	2.63	2715
13. Meghalaya	—	—	—	—	—	—
14. Nagaland	—	—	—	—	—	—
15. Orissa	3830	50854	200.77	100.00	13.28	8242
16. Punjab	9432	12088	103.34	100.00	1.37	1096
17. Rajasthan	7297	35795	212.00	100.00	4.91	2905
18. Sikkim	215	405	1.09	95.7	1.88	884
19. Tamil Nadu	12627	16633	321.00	100.00	1.32	2542

Village Panchayats

20. Tripura	476	871	12.56	90.00	1.83	2639
21. Uttar Pradesh	72853	112624	759.53	100.00	1.55	1043
22. West Bengal	19662	38047	328.68	98.00	1.94	1672
<i>Union Territories</i>						
23. A & N Islands	38	163	0.60	52.0	4.29	1579
24. Arunachal Pradesh	701	2776	4.10	95.0	3.96	585
25. Chandigarh	22	22	0.32	100.0	14.00	1455
26. Dadra & Nagar Haveli	10	72	0.74	100.0	7.20	7400
27. Delhi	204	258	4.19	100.0	1.26	2054
28. Goa Daman & Diu	189	443	6.31	100.0	2.34	3329
29. Lakshadweep	—	—	—	—	—	—
30. Mizoram	—	—	—	—	—	—
31. Pondichery	—	—	—	—	—	—
All India	222055	585438	4131.03	98.9	2.64	1995

Appendix 4.
Coverage of Panchayat Samities and Zila Parishads
 (As on 31st March 1977)

States/U.Ts.	No of Districts	No. of Blocks into which delimited	No. of Zila Parishads	No. of Panchayat Samities	Average No. of Panchayat Samities per Zila Parishad	Remarks
1. Andhra Pradesh	21	324	21	325	15.5	
2. Assam	10	130	20 (a)	—	—	(a) Mohkuma Parishads
3. Bihar	31	587	8	210	26.3	
4. Gujarat	19	219	19	182	9.6	
5. Haryana	11	87	—	87	—	
6. Himachal Pradesh	12	69	12	69	5.7	
7. Jammu & Kashmir	19	73	—	—	—	
8. Karnataka	19	175 (a)	19 (b)	175	9.2	(a) Taluk community development units. (b) District development council.
•						
9. Kerala	11	144	—	—	—	
10. Madhya Pradesh	45	457	—	390	—	
11. Maharashtra	26	343	25	296	11.8	
12. Manipur	6	14	—	—	—	
13. Meghalaya	3	24	—	—	—	
14. Nagaland	3	21	—	—	—	
15. Orissa	13	314	—	314	—	
16. Punjab	12	117	12	117	9.8	
17. Rajasthan	26	232	26	232	8.9	

Village Panchayats

18. Sikkim	4	—	—	—	—	—
19. Tamil Nadu	15	374	24 (c)	374	15.6	(c) District development councils.
20. Tripura	3	17	—	—	—	
21. Uttar Pradesh	57	875	55	875	21.7	
22. West Bengal	16	335	15	325	21.7	
Union Territories						
23. A. & N. Islands	2	5	—	—	—	
24. Arunachal Pradesh	5	43	5	45	9.0	
25. Chandigarh	1	1	1	1	1.0	
26. Dadra & Nagar Haveli	2	2	—	1 (d)	—	(d) Varishta Panchayat.
27. Delhi	1	5	—	—	—	
28. Goa, Daman & Diu	3	12	—	—	—	
29. Lakshadweep	1	4	—	—	—	
30. Mizoram	3	20	—	—	—	
31. Pondichery	4	4	—	11 (e)	—	(e) Commune Panchayat
All India	395	5026	262	4028	15.4	

Appendix 5
Income of Panchayat Raj Institutions from Taxes

State/U.Ts.	Gram Panchayats		Panchayat Samities		(Rs. in lakhs)	
	1974-75		1975-76		Zila Parishads	
	1974-75	1975-76	1974-75	1975-76	1974-75	1975-76
1. Andhra Pradesh	643.00	743.39	—	—	—	—
2. Assam	23.25	23.25 (R)	—	—	N.A.	N.A.
3. Bihar	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
4. Gujarat	—	—	257.89*	257.14*	N.A.	N.A.
5. Haryana	N.A.	1.05	N.A.	10.94	—	—
6. Himachal Pradesh	6.50	7.59	2.02	1.54	—	—
7. Jammu & Kashmir	4.05	4.05 (R)	—	—	—	—
8. Karnataka	342.69	342.69 (R)	221.81	221.81 (R)	—	—
9. Kerala	41.90	455.00	—	—	—	—
10. Madhya Pradesh	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
11. Manipur	0.05	0.05 (R)	—	—	—	—
12. Meghalaya	—	—	—	—	—	—
13. Nagaland	—	—	—	—	—	—
14. Orissa	—	4.06	—	—	—	—
15. Punjab	20.41 (R)	14.70	N.A.	N.A.	—	—
16. Rajasthan	13.64	24.0	51.40	96.90	—	—
17. Sikkim	—	0.51	—	—	—	—
18. Tamil Nadu	117.00	117.00 (R)	1338.34	765.21	—	—
19. Maharashtra	389.43 (R)	406.00	N.A.	N.A.	—	—
20. Tripura	0.10	0.50	—	—	—	—

Village Panchayats

21	Uttar Pradesh	276.00	276.00 (R)	—	—	57.51	57.51 (Rs.)
22	West Bengal	87.20	88.30	2.08	2.29	49.05	55.00
	Union Territories						
23	A & N Islands	—	—	—	—	—	—
24	Arunachal Pradesh	N.A.	0.27	—	—	—	—
25	Chandigarh	01.7	0.06	0.11	0.16	—	—
26	Dadra & Nagar Haveli	0.37	0.40	—	—	—	—
27	Delhi	—	—	—	—	—	—
28	Goa Daman & Diu	—	0.12	—	—	—	—
29	Lakshadweep	—	—	—	—	—	—
30	Mizoram	—	—	—	—	—	—
31	Pondicherry	—	—	17.10	19.75	—	—
	All India	1965.76	2508.99	1590.75	1375.74	106.56	112.51

N.A. = Not Available

(R) = Estimated Figure on the basis of previous year

* = Including Income of Zila Parishads. Break up Not available

Land Tenures, Land Revenue and Agricultural Tax

LAND TENURE

Importance and Meaning

Agricultural productivity in India has been low not only because the peasant producer is impoverished and disease-ridden but also because the investible surplus is most frittered away in non-productive consumption. Both these facts are intimately related to the institutional factors, *viz.*, who owns the land ? how land is used ? and for whom does the tiller of the soil produce ? for himself, for the land-lord, for the market or for the community ? Till recently the agrarian system in India was a powerful obstacle to economic development and higher agricultural production. In this connection the observation of U. N. O. needs consideration. It says that, "in the *first place*, the tenant has little incentive to increase his output since a large share in any such increase will accrue to the landowner, who has incurred no part of its cost. *Secondly*, the high share of the produce taken by landowner may leave the peasant with a bare minimum subsistence with no margin for investment. *Thirdly*, it means that wealth is held in the form of land that accumulation of capital does not lead to productive investment.... In such conditions it is important to emphasise that the existence of large-scale property ownership does not secure any of the advantages of large-scale operation or investment. The tenants secure no benefit of working with better equipment or with better seeds, their methods of work are the same as the small owner."¹

There are two problems deserving consideration, *viz.*, the problem of land tenure, *i.e.*, the legal or customary system under which land is owned, and the problem of land tenancy *i.e.*, the system under which land is actually cultivated and the product divided between the owner and the cultivator. In a study of the systems of land tenure are discussed the questions of landownership, sale or mortgage of land and how far these rights are recognised by law or custom while under land tenancy are studied the questions of

1. U. N. O. *Land Reforms—Defects in Agrarian Structure as Obstacles to Economic Development*, 1951, p. 18.

security under which the cultivator holds land and of the division of the product.

The 'tenurial system' identifies the ownership of land and the relationship of the owner with the cultivator. In other words the system of 'land tenure' refers to the system of ownership of land and the terms and conditions under which land is leased to the tiller by the landlord. According to Raleigh Barlowe ; "land tenure concerns all of the ways in which people, corporate bodies and governments share in the bundle of property rights ; and it concerns also the time periods during which these rights are held".¹ Thus land tenure refers to the pattern of rights and responsibilities under which people hold, occupy and use landed property. The system encompasses such things as the owner, the cultivator, and the government, interrelation among them and the rights and obligations of each.

The study of land tenure system is of great significance from the point of view of the state, the cultivator and the economy of the country. (i) The state has to identify the land owner to recover the necessary land revenue. (ii) The cultivator is the backbone of the rural economy and his role is of significant importance in the tenurial system as this will have far reaching consequences on the productivity of land. (iii) The organisation of rural society and village institutions depends on tenurial system. This does have agro-economic consequences as the economy of the country.

Land Tenure System in Hindu Period

Eminent authorities like Baden Powell and Dr. Mukherjee maintain that private property and peasant proprietorship existed in India even in the Vedic period. There are others who maintain that land was the property of the king, *i. e.*, of the State. *Manusmriti* maintains that "land is the property of him who cut away the wood or who tilled and cleared it" (ix. 44). But Yajnavalkya says that "land belongs to the king and the tiller possesses only the usufructuary rights for life." In the *Arthashastra* (I. 41) it is maintained that "land may be confiscated from those who do not cultivate it and given to others ; or it may be cultivated by village labourers and traders, lest those owners who do not cultivate it might pay less." And further, "land prepared for cultivation shall be given to taxpayers only for life." In Jaimini's view (*Purva Mimansa*) (vi. 7, 3) "the king cannot give away the earth because it is not his exclusive property but is common to all beings enjoying the fruits of their own labour in it." This indicates that state ownership was not totally absent, but limited by or combined with common ownership of the village.²

1. Barlowe, R. *Land Resources Economics : The Political Economy of Rural and Urban Land Resources use*, 1963, p. 373.

2. Quoted by Radha Kumud Mukerjee *Indian Land System*, p. 23.

Prof. Mukerjee gives the following picture of land tenure existing in ancient India prior to the Muslim period :¹

"There was the king having no property right in land except the right to a share of the produce. Below the king were the cultivators (*khud-kasht-owner*, cultivator-*raiya*, or members of joint village community), having the actual ownership of land. The king's customary share was equal to 1/6th to 1/4th of the produce, which was known as customary *pargana rate*."

"It may be noted that : (i) In certain parts of eastern and western Punjab, C.P. (now M.P.), M.P., southern India, all village lands were jointly held by village communities ; (ii) In Bombay, Berar, Madhya Bharat, Madras and Bengal, there was individual ownership of land subject to payment of kings' share and periodic or occasional payment of a share of the produce to the village chief or headman."

The demand of the State varied automatically with the outturn, and no elaborate system of suspensions and remissions of the revenue was thought necessary. The State had merely a right to a share always in kind. But this proved disadvantageous from the point of view of the cultivators as the whole crop had to be kept rotting on the ground till the officers of the king came to supervise the division. Hence, this inconvenience gave place eventually to the payment in money. In the Muslim period, there was revival of trade and expansion of money economy. Commutation of produce-rent increased the economic powers of rent collectors and revenue farmers.

Land Tenure System in Muslim Period

As distinguished from the earlier system, land revenues were collected not by officials of the State but by local chiefs or lieges with whom settlements were made by the Central State authorities. This system was extended and regularised under the Muslim rule. The chief or lieges—*subedars*, *nawabs*, and princes, in their turn made settlements with the lower lieges who also too often became independent rulers. During the Muslim rule, the assessment of land revenue was more systematised and standardised. The process was initiated under Sher Shah and perfected under Emperor Akbar. During the latter's reign, 1/3 of the 10 years' average produce was fixed as the state revenue payable in cash. This method of assessment was applied in case of land which was in continuous cultivation. But in the case of land which, on occasions, remained fallow, full rent was collected only in the year of cultivation and no rent was levied during the fallow period. In the case of land out of cultivation for 5 years, a reduced rate was charged to encourage cultivation.

According to Prof. Mukerjee, "during the Mughal period: (i) *zamindari* (i.e., the state right) developed into kings' superior

1. Mukerjee, K., *Land Reforms*, 1952, p. 1.

ownership of the entire domain, but the concurrent hereditary, permanent and long established right of the *khud-kasht raiyats* in the soil was recognised ; (ii) old chieftains remained who collected and transmitted local revenues to the ruler; and (iii) *zamindars* and *jagirdars* came into existence between the state and *khud-kasht raiyats*.¹

The right of collecting land revenue for a *pargana* or district was sold out by public auction to the highest bidders who were held responsible for the payment of the amount, thus, fixed in one lump sum into the government treasury, retaining for themselves any surplus over it. These tax-farmers squeezed out of the cultivators as much as possible and paid to the Government as little as they could. In some cases, the Hindu chieftains or *rajahs* subdued by the Mughals were made the revenue farmers under the Imperial Warrant. Although at first the office of the tax-farmer was not hereditary and was subject to the supervision of the state officials, it tended to be so as the control of the central authority weakened. Thus, by the middle of the 17th century zamindars, assignee and farmers of land taxes had greatly strengthened their position. They consolidated their positions by bringing waste land under cultivation as their own land by buying up the small farmers.

It may be noted that the system that had developed under the Mughal emperors had the following characteristics:²

- (i) Land belonged to the peasant, in the sense, that he enjoyed hereditary occupancy right if he was a resident of the village. Even his rent could not be increased by the zamindar beyond the customary level (*nirikh*).
- (ii) Land could neither be purchased nor sold. Generally the peasant was not evicted; even if he was evicted for failure to cultivate, land was not to be resumed as the *khas* land of zamindar, but another peasant had to be invested with its occupancy right.
- (iii) The zamindars whose tributes to the ruler were fixed, were themselves petty rulers and had to fulfil the traditional duties of a ruler for the betterment of agricultural operations.

Land Tenure System Under British Rule

When the East India Company acquired political control in one part of the country after another they took over the traditional system; but the whole character of land system was transformed by them through the introduction of the British concepts in India. It was assumed that the State was the supreme landlord. In the place of the traditional share of the Government in the produce, paid by the village communities as a whole there was introduced a system of fixed payments in cash assessed on land which had no reference to

1. Mukerjee, K., *Land Reforms*, 1952 p. 11, p. 2.

2. Sen Bhawani, *Evolution of Agrarian Relations in India*, 1962 pp. 55-56

the good or bad harvest. In most cases the assessment was individual whether levied directly on the cultivator or on land lords appointed by the State. In 1793, Lord Cornwallis gave the revenue farmers the proprietary rights over their estates in return for their agreeing to pay a fixed amount as land revenue to the British. The result of this agreement was that the zamindars who were merely collectors of land revenue were converted into landlords and original cultivators were reduced to the position of tenants. Thus, between the cultivating holder and the Government a third party with an interest in land had grown up in zamindari areas. In most parts of Bengal sub-infeudation had been created. When the estate was too big, the zamindar would hand over a part of it on lease to a tenure holder. In such adjustment there have been four interests in land which may intervene between the cultivator and the government, as will be clear from the table given by Baden Powell¹ :—

One Interest	Two Interests	Three Interests	Four Interests
1. The Government is sole proprietor, i.e. State Landlordism.	1. Government 2. The raiyat or occupant with defined title (not a tenant) as in Madras or Bombay i.e. <i>Raiyatwari System</i> .	1. Government 2. Landlord zamindar, Talukdar, or a joint village body regarded as a whole. 3. Actual cultivating holders, individual, co-sharers, i.e. <i>zamindari system</i> .	1. Government, landlord, Sub-proprietor or tenant holders. 2. <i>raiyyat</i> or cultivating holders. 3. Actual proprietor or landlord. 4. Actual cultivating holders, individual, co-sharer i.e. <i>mahal wari system</i>

The land revenue was considered as a rent rather than a tax. Under British rule, the system of assessment and collection of revenue varied according to the varying circumstances of different States and to suit administrative convenience. So that "the system of land tenure in India exhibited almost every conceivable variation from immense estates containing thousands of tenants to minute holdings of well under an acre in size."

In Bengal and parts of Madras the zamindar and a number of sub-proprietors below him intervened between the Government and the cultivating holder. In parts of U.P. there were groups of co-sharers on village communities claiming collectively to be the landlords of the estate, and collecting revenue from the cultivating holders whom they regarded as their tenants. There were in Oudh, persons known as the *talukdars* claiming proprietary rights over these joint villages.

"Indian tenures are largely the results of changes and growths, the fruits of wars and incursions, tribal and local conquests or usurpations and of the rise and fall of the ruling families ; the right

1. Baden Powell, *Land Revenue of British India*, 1928, p. 129

by conquests or birthright supervenes upon the right by first clearing." All rights of ownership in land in India rested on two bases, *i.e.*, the right of first clearance and the inheritance right which originates in grants, conquests or natural superiority.¹ The right of clearance is the right of the individual holder which arises from the fact that he was the first to occupy the plot of land and bring it under cultivation. This was till recently the basis of raiyatwari holding and the privileged position claimed by the cultivating holders who have been reduced to the position of tenants under landlords in zamindari and other landlord estates.

In India it had been a long practice for the rulers to make grants of villages to their dependents and the grantee was entitled to the State's share of the produce. But the grantees by bringing wasteland under the plough, and by buying up poorer land, holders claimed to be the landlords of the whole village and in course of years succeeded in making the cultivators forget that they had independent rights. So that the descendants of the grantees held the village jointly while the cultivating landholders had sunk to the position of the tenants with some special occupancy privileges. Above these joint villages another right had grown up in U.P. In Agra the *Rajahs*, who had been employed as revenue farmers by the kingdom, had acquired certain rights over a number of such villages by the time the Province came under British rule. In these cases the village owners had been recognised by the British Government as actual proprietors and the land revenue settlement had been made with them but a sort of overlordship or talukdari interest over them had been assigned to the talukdars who were paid 10 per cent of the land revenue raised from the villages as talukdari allowance. The *talukdars* of Oudh also originated in this way.

Thus in India, over the right to land which was created by first clearance, a number of other rights had grown up—rights which originate in conquest, grant of natural superiority. Enterprising revenue farmers and State officials had risen and ruling chiefs had sunk to the position of landlords. Rights of this kind (inheritance right) resided either in one landlord or in a body of co-sharers having overlordship over a village or a large estate. To quote Baden Powell, "claims grew, one set of rights were superimposed upon another and in many cases—as zamindari areas of Bengal and in the talukdari estates of Oudh—various grades of rights in land were found to co-exist."

Three Systems of Land Tenures On Eve of Independence

"The system of land tenure in India exhibited almost every conceivable variation from immense estates, containing thousands of tenants to minute holdings or well under an acre in size. It is nevertheless possible to classify the holdings into certain fairly well-

1. Baden Powell, *Land Revenue and Its Administration in India*, Rp. 122.

defined groups." There were three main types of land tenures ; such as :

- (a) Landlord tenure, which was called *zamindari* system.
- (b) Independent single tenure which was described as *raiyyatwari* system.
- (c) Joint-village or village community tenure which was known as *mahalwari* System.

This classification was based on the relationship between the holder and the Government. *The type of tenure in each case determined form of settlement of the land revenue, the gradations of interest and rights in land, their recognition and inter-relation and the nature of the unit of assessment adopted.*

From the point of view of duration, there were two types of tenures, viz., permanently settled estate system, known as *parmanent zamindari*, and temporarily settled estate system, called *temporary zamindari*.

Permanent zamindari system existed in Bengal, Bihar, Orissa (about one-half), Assam (small portions) Banaras and north Madras (about one-third) where the share of the State was fixed in perpetuity. *Temporary zamindari* (or the *jagirdari*) settlement existed in U.P. The *Jagirdari* system which prevailed mainly in Punjab, Rajasthan and the princely States of the Central India was merely another variety of temporary zamindari settlement only under a different name. In M.P. the system was known as *malguzari* and in U.P. it was known as *mahalwari*.

The essence of zamindari system consisted in making private landlords the proprietors of estates on condition of payment of a stipulated revenue to the State. The peasants obtained holdings by leasing the same from landlords who stood between the State and the tiller. The revenue was assessed in lump sum on the whole estate and tenant farming was the general rule under such system. The Zamindari system prevailed on about 40 per cent of the land under cultivation. Since Independence it has ceased to exist in its old form.

Under the *raiyyatwari* system, land was held direct from the State by the *raiyyat* i.e., the individual tenants. The *raiyyat* could not be ejected by the Government so long as he paid the fixed assessment. In such system, the owner farming was the rule though of late owners began to let out the land to tenants-at-will.

Under the *mahalwari* system, the villages concerned were units by themselves, the ownership of property was joint or communal. These villages or *mahals* were settled with directly, though a co-sharer of standing was generally selected to undertake the primary liability of paying the land revenue. Under this system the details regarding procedure, period of settlement and assessment of land

revenue varied from place to place. The cultivation was usually done by a class of tenants in U.P. but in the Punjab often the owners themselves cultivated the land.

The following chart reveals the distribution of three principal land tenures established under the British rule :¹

Varieties of landlord tenure	Varieties of joint village tenure	Varieties of independent single tenure
1. Permanent settlement (Zamindars of East and West-Bengal)	1. U.P. Mahalwari settlement except Oudh Talukdars.	1. Madras raiyatwari.
2. Temporary settlement (remaining Zamindars of East and West Bengal).	2. Punjab Mahalwari.	2. Bombay and Berar raiyatwari
3. Temporary settlement (Oudh Talukdars).	3. M.P. Malguzari.	3. Special systems of Assam and Coorg.

Of the total area under three main types of land revenue, 38 per cent belonged to raiyatwari, 24 per cent to permanent settlement and 38 per cent to temporary settlement at the time of Independence.

It may be noted that the period of temporary settlement varied from 30 years in Bombay, Madras and U.P. to 20 years in Central Provinces and 40 years in Punjab.

Marx has described the main characters of three types of land tenure in India as follows :²

"The history of English in India is a string of futile and really absurd economic experiments. In Bengal, they created a caricature of large-scale English landed estates : in south-eastern India a caricature of small parcelled property, in the north-west they did all they could to transform the Indian economic community with common ownership of the soil into a caricature of itself."

(1) The Raiyatwari System

This system was first introduced in the districts of Baramahal (Madras) by Captain Read and Thomas Munro in 1792 and was gradually extended to other parts of the province and thereafter to Bombay, Berar and Central India. Later on the system was extended to Mysore, Assam and Hyderabad. Although originally the raiyat was the actual cultivator, there were many non-cultivating or absentee raiyats.

The ryotwari tenure is characterised by the following principal features :

1. Mukerjee, K., *Op. cit.*, p. 6.
2. Marx, Karl, *Capital*, Vol III, 1959, p. 328.

(a) Under this system, the raiyat or the registered holder of the land is recognised as holding the land directly from the government without the intervention of any intermediaries. His tenure is known as the *occupancy tenure* but the ownership of all land including the waste land lies in the state.

(b) The holder of the land is a mere occupant and as such has the right to use, transfer by gift, sell, or sub-let or mortgage or otherwise dispose of the land. He holds the land in perpetuity so long as he pays the land revenue to the state. Hence, he cannot be ejected by the Government so long as he pays the fixed assessment.

(c) The occupant has a right to resign any field or fields at his option. He can, thus, contract the area held by him by resignation or extend it by purchase in accordance with the state of his resources.

(d) The occupant can lease a portion or the whole of his holding on annual tenancy at a rent agreed upon with the tenant. The tenant under the raiyat has no statutory rights. He has no permanent interest in the land he cultivates. If the tenant sows improved seeds or puts in good manure or extra labour to improve the land he has no guarantee that he will get an extra return for his labour and enterprise. The absentee raiyat cares only for the rent and takes no interest in the improvement of the land. Under this system the tenants are called tenants-at-will or non-occupancy tenants raiyat they have to work as terms and conditions laid down in the lease by the owners.

(e) If the Government sells the holding of the raiyat for areas of land revenue and *takavi loans* the purchaser has a clean title, the sale conveying the land free of all encumbrances.

(f) The assessment is a charge upon the crop and the arrears of previous years a first charge on the holding. The revenue is regarded as a rent and not as a tax. Every holder is individually responsible for payment of the land revenue. The assessment is fixed for a period of 20 to 30 years and is periodically revised under a survey settlement.

Raiyatwari system is based on Arthur Younges' view that "the magic of property turns into gold."

Raiyatwari system is to be found largely in Assam, Gujarat, Maharashtra, Madhya Pradesh and Tamil Nadu.

There are two kinds of *raiayatwari* holdings : (i) those in which each individual occupant holds directly from government, and (ii) those in which the land is held by the village communities, the heads of the village being responsible for the payment of revenue of the whole village area. In Maharashtra, Assam and Tamil Nadu the raiyatwari tenure is on the individual basis.

The main advantages claimed for this system are : (i) that there is no sub-infeudation and the cultivator is in direct relation with the government, (ii) There are no intermediaries, (iii) The raiyat is at liberty to sub-let his land and can enjoy a permanent right of tenancy so long he pays the land revenue.

But this system suffers from certain defects too : (i) The land in these areas passes into the hands of non-agriculturists and the number of the landless labourers is increasing, and the size of holdings going smaller and smaller. (ii) It is also defective in the methods of assessment of land revenue. It leaves too much to the Settlement Officer whose estimates are based on mere guess-work. (iii) The individual assessment has destroyed the collective basis of village life and has led to the decay of the village community.

Although raiyatwari tenure vested proprietary rights on the peasants, this proprietorship was very soon lost to the same elements who had become zamindars in Bengal, Bihar and Orissa. The money lenders were very prominent in this respect in the raiyatwari areas. As a result a new class of landlord began to rise in these areas dispossessing the actual tillers of the soil of their proprietorship, as would be clear from the quotation given below¹ :—

“The tenant who cultivated land on lease, which is generally annual, is not sure how long the land would remain in his possession as the landlord has the power to resume that land after the end of the year giving three months’ notice to the tenant. Thus the tenant has no permanent interest in lands. In many cases, land is leased on the crop-sharing basis. If the tenant sows improved seeds or puts in good manure or extra labour to improve the land, half of the increased production so obtained at his cost goes to the landlord, the tenant does not get a proper return on his labour and enterprise. The absentee landlord cares only for his annual rent and takes no interest in the improvement of his land or the introduction of improved methods of cultivation.”

(2) Mahalwari System

The *Congress Agrarian Committee* has defined this system in these words.² “The principle of *mahalwari* or joint village system, first adopted in Agra and Oudh and later extended to the Punjab were laid down in Regulation IX of 1833. Under this system, the villages concerned were units by themselves and the ownership of property was joint or communal. These villages or *mahals* were settled with directly, though a co-sharer of standing was generally selected to undertake the primary liability of paying the land revenue. Under this system, the details regarding procedure, period of settlement and assessment of land revenue vary from place to place.”

1. *Final Report of the Famine Enquiry Commission*, p. 269.

2. *Report*, p. 33.

John Stuart Mill described it thus : "The peasant proprietors compound with the State for a fixed period. The proprietors do not engage individually with the government but by village, through its headman, undertakes to pay so much for so many years themselves assigning to each man his quota. Primarily each man cultivates and pays for himself but ultimately he is responsible for his co-villagers and they for him ; they are ultimately bound together by a joint responsibility. If one of them is compelled to sell his rights to meet demands upon him, the others have the right for pre-emption."¹

In the ancestral villages, each co-sharer paid a proportion of the land revenue exactly corresponding to the fractional share of the estate ; while in the non-ancestral villages the amount each sharer was to pay was proportionate to the actual holding. Such tenure prevailed in the Punjab and U.P.

Whether these co-sharers themselves cultivated the land, or they had below them a class of tenants, depends upon the way in which the joint village has originated. If the body of the co-sharers (as in U. P.) has grown up over an already existing village, the original cultivators would have sunk to the level of the tenant paying rent to the co-sharers who divide the amount so collected among themselves. If the proprietary body belonged to a superior of a military class as in the Punjab and U. P. the cultivation was carried on by the tenant and not by the co-sharers. But when the village has been established on a new soil by a co-operative colonizing group or by an active and energetic conquering tribe whole descendants were the joint owners of the village the co-sharers may themselves work on the land with the help of their families. But here also tenants may be found.

In a joint village the village common or *Shamlat* and the wasteland belonged to the co-sharers and not the government. The co-sharers may let it out on rent to tenant and divided the rent among themselves and brought it under cultivation. Each co-sharing body has its own special holding or home farm better known as *Sir* land. It was the private property of the cosharing landowner and no one could claim to have been its owner in the past. We hear less of *Sir* land in the Punjab because there the co-sharers themselves cultivate the land, and usually there are no tenants who hold from them. The *Sir* land was important in U. P. and M.P.

The co-sharing families in the joint village shared the land or its yield according to one of the three principles :

(i) The first was the ancestral or family share system. Each of the co-sharing families got a fraction of the whole, determined by its place in the genealogical tree. Among these ancestral villages themselves there were three distinct varieties : (a) the present body

1. Quoted by K. Mukerjee, *Op. Cit.*, p. 16

of the joint owners might hold the whole estate undivided (as in the case of a joint undivided family), viz., *zamindari mustarkas* ; (b) or the co-sharing families might agree to partition the estate among themselves on the ancestral principle, viz., *pattidari* ; (c) or the co-sharers might divide only part of the estate, leaving the waste land the area cultivated by the occupancy tenants undivided, viz., *imperfect pattidari*. In the case of joint villages held on the ancestral system, the present body of proprietors are descendants of a common ancestor who acquired landlord rights over the estate.

(ii) The second system was adopted in the non-ancestral villages which had been established by colonisation of conquering groups, and villages which had forgotten all remembrances of ancestral shares. Here the land was shared by the co-sharers according to customary or *bhaichara* principles in (a) equal lots made up artificially of various types of land (from good and bad land in the village) ; or (b) according to the number of ploughs owned ; or (c) with reference to share in water ; or (d) share in well.

(iii) There was a system of *de facto* holdings. In villages which followed this principle there was no sharing. Nothing but *de facto* holding was recognised. This may be due to the fact that originally when the village was established land was abundant and each family took what it wanted or had the ability to cultivate or to the gradual decay of an earlier system of definite shares.¹

For revenue, one sum was assessed for the whole village for which all the co-sharers were jointly and severally responsible. The revenue was collected by the village *numberdar*, for which he was given a commission of 5 per cent.

(3) Zamindari System

This system was mainly the result of the reluctance of the British, during the early days of their rule in India, to deal directly with the cultivating holders for the collection of land revenue. When parts of India gradually began to pass under British rule, the British administrators were faced with the problem of making arrangements for the collection of land revenue. Numerous factors made them prefer dealing with the raiyats through middlemen. *Firstly*, the task of surveying and assessing the small holdings of millions of cultivators, and of collecting the land revenue from them was a gigantic and formidable one. *Secondly*, the complex administrative machinery needed for this purpose had not been built up till then. Combined with this natural disinclination to deal directly with the raiyats was the idea of landlord and tenant to which they had been accustomed in England, and they therefore proceeded on the basis that the cultivators must hold their lands from the landlord. This made them extremely willing to recognise some one person as

1. Baden Powell, *Land Revenue and Its Administration in British India*. pp. 76-87.

the landlord of an estate and thus make him responsible for the payment of land revenue levied on the estate as a whole. The Britishers were anxious to find suitable persons, i. e., the zamindars and the various revenue or tax farmers or revenue collecting officers of the mughals, who were though in reality the landholders and not the proprietors having any proprietary rights in the soil, but had strengthened their position during the disturbed days that followed the break-up of the Mughal empire and now claimed to be landlords, came in very handy. The British recognised them as landlords and they, in turn, agreed to pay a stipulated amount as land revenue on their estates. Thus according to Sir Richard Temple, "the Permanent Settlement in Bengal was a measure which was effected to naturalise the landed institutions of England among the natives of Bengal."¹ The zamindars who were originally either the local chiefs, *rajahs* or other grantees or the agents of government and therefore, under the supervision of the government were declared full proprietors of the areas over which their revenue collection extended. The assessment was fixed at about 10/11ths of what the zamindar received as rent from raiyats the balance of 1/11th constituting the zamindar's remuneration. The revenue liability was fixed in a rough and ready manner without any survey of landed rights, and interests or any investigation into the productive capacity of the different classes of soils. The intention of protecting the tenants as well was never made effective. The landlords became a functionless parasitic class interested in getting the maximum rent from the peasants and Cornwallis dream of creating in Bengal a beneficent landlord capitalist system resting on the contentment of the cultivator failed to materialise.²

In thus hastily recognising the claims of zamindars and other revenue farmers to proprietary rights, the Britishers sacrificed the interests of the millions of cultivating raiyats. Those who were the real proprietors of the land they cultivated now sank to the position of tenants holding their land from the zamindar. The inevitable result was the creation of absentee landlords and degradation of the original holders to a position of semi-serfdom, e. g., in U. P. the creation of *talukdars* in Avadh after the war of Independence (1857) was dictated by the political necessity irrespective of the rights of the mass of peasantry. Dr. B. R. Misra has remarked that "Government entirely for political considerations, subordinated and sacrificed the interests of the millions to the interests of the few."³ This resulted in the creation of landlordism, the conversion of occupants into full-proprietors, and under-proprietors, and the emphasis on the distinction between the superior proprietors and under-proprietors which have been responsible for the deterioration of the economic position of the raiyats and for the growth of a class of capitalistic rent-receiving intermediaries.

1. R. Temple, *Men and Events of My Time in India*, p. 30.

2. Quoted by A. Haque in *Mau Behind the Plough*, p. 255.

3. B. R. Misra, *Land Revenue Policy in U. P.*, pp. 196-197.

All these landlord estates fell into two broad classes, viz., those permanently settled and those temporarily settled.

(1) Permanent Settlement

The Permanent Settlement was introduced in Bengal by Lord Cornwallis in 1793. The system was later extended to other parts of the country as the Directors of the E. I. Co., were favourably impressed by this system. It was, therefore, applied to Banaras, to north Madras, to U. P., and parts of south Madras. In 1885 this system was formally abandoned as the state could not enhance its land revenue.

The permanent settlement had three main features : *Firstly*, it gave the zamindar proprietary rights in the soil, subject to his paying regularly the land revenue due from the estate. *Secondly*, in order to encourage the landlords to invest money in the improvement of their estates it fixed the State demand in perpetuity. *Thirdly*, if the land revenue due from the zamindar was fixed at a lump sum (10/11ths) this assessment was declared fixed and unalterable. The State sacrificed its right to enhance the land revenue due from the estates under the zamindars in order to induce them to spend capital on the development of their estates and to encourage the expansion of cultivation.

Result of Permanent Revenue Settlement

(1) *It failed to define and protect the rights of the raiyats.* The permanent settlement had disastrous results for the cultivating raiyats. At the time of the Permanent Settlement the *Khudkasht* ryot had real proprietary rights in the soil ; the land revenue which they paid to the zamindars was regulated by customary rates (known as *pragana rates*) and they could not be ejected so long as they paid those customary rates. They had also "a number of communal privileges in regard to homestead plots and to the pasture and forest lands, bunds, tanks, irrigation channels and fisheries to the services of the village servants or officials, and to the pick of fields left unoccupied." The permanent settlement, while it gave zamindars the proprietary rights in the soil, left undefined the customary rights of the raiyats. The result was to place the raiyats entirely at the mercy of the zamindars, who gradually secured the right to enhance the amounts due as land revenue from the ryots and to evict them. Further, no attention was paid to the rights of the heritability and transferability of the holdings enjoyed by the raiyats. The tenants suffered doubly, *first*, by losing their proprietary rights in the lands they held, and *secondly*, by the lack of provision for an appeal to a higher authority for the redress of their grievances.

In the period between 1793 and 1859, the ryots were left to the mercy of the zamindars and the rights were completely effaced. "Within a few decades not merely were the customary rates all broken up, district by district, but the rights of the raiyats were so completely

obliterated that...it was difficult to find a single vestige or ascertain what they were when the first tenancy legislation was being considered."¹ In fact, in the interval of 66 years while the proprietary body grew in strength and prospered in wealth, village communities perished, the pargana rates disappeared, and most vestiges of the constitutional claims of the peasantry was lost in the usurpations and encroachments of the landlords.² So says Dr. R. K. Mukerjee that, "the landlords encroached upon the restricted rights in the village commons, and displayed little practical interest in the improvement of the condition of the tenants as they were merely concerned with exacting as much revenue as possible from the raiyats."³ Further, the landlord magnates whether the *zamindars* of Bengal or the *talukdars* of Avadh or large landowners of the canal colonies in the Punjab, had neglected their duties towards the raiyats, done very little towards the improvement of the land and contributed by their indifference and neglect to the growing impoverishment of the agricultural classes.

(2) *It led to sub-division of rights in land.* The zamindar leased out their interests, and the middlemen leased out in turn, creating a long chain of rent receivers and rent payers who intervened between the State and the actual cultivators. This feudalism on the one hand and serfdom on the other, were the principal characteristics of the land system of Bengal.

Owing to the practice of sub-letting, 30% of the land in Bombay and Madras was not cultivated by the tenants themselves. The *Simon Commission* reported about Bengal that : "In some districts, the sub-infeudation has grown to astonishing proportions, as many as 50 or more intermediaries interests having been created between the zamindars at the top and the actual cultivators at the bottom."⁴ With the increasing sub-infeudation, relations between the zamindar and the cultivator became more strained and a greater gulf was created between the two.

By vesting the zamindar with all residuary rights of property, the government exalted their status and helped a continuous improvement in their condition. On the other hand, the rights of the raiyats were exposed to damage. The practical security given by custom was shattered in and its place were substituted the shadowy protection of the courts and a vague promise of succour in future. By thus undermining the protection of the raiyats and giving a new bias to the interests of the zamindars, the Permanent Settlement altered the balance of rural society in Bengal.⁵

1. Mukerjee, R. K., *Economic Problems of Modern India*, Vol. I, p. 220.

2. *Ibid.*, p. 220.

3. *Ibid.*, p. 220 ; and H. D. Malaviya, *Land Reforms in India*, 1954, p. 123.

4. *Simon Commission Report*, Vol I, p. 340.

5. S. Gopal, *The Permanent Settlement in Bengal and its Results*, 1949, p. 25.

(3) *It also increased rack-renting.* It was estimated that 50 to 60 per cent of the gross produce on an average was handed over by the cultivator to the landlords towards the payment of rent. A survey of 27 farms under tenancy in the Punjab indicated that "of the net income of cultivation, less than 80% is enjoyed by the worker and the rest goes to the non-working owner of the land. Rack-renting has reached to a great extent in the areas where the system of crop-sharing prevails."¹ According to Dr. Gyan Chand, "in Bengal nearly 1/5 of the total sown area of the province was cultivated under this system. These crop-sharers were generally landless labourers, expropriated proprietors or occupancy tenants with unduly small holdings. The proportion of the landlord's share in the crop varied, but one half was the rule. The land-lord saved the cost of cultivation, avoided all risks in the enterprise and was yet assured of some return from his lands. In addition to his share, he made the tenant pay premium and render other services for being permitted to cultivate land." In Bihar, landlord's share except where it was a fixed quantity of grain per bigha, was nine twentieths but this led the landlord to call upon the tenant to render services, make presents or pay dues on tolls. In U.P. nearly one-fourth of the sown area may be said to be under this system. The share croppers had to pay half the gross produce and in most cases many perquisite levies. In the Punjab, about 50% of the sown area was cultivated by tenants-at-will who were all share-croppers. The proportion of the landlord's share in this province varied from 1/4 to 1/2, but the latter was generally the rule.

The rapid increase in the number of co-sharers was the most disquieting feature and an indication of the extent to which the hereditary *ryots* were losing their status and being depressed to a lower standard of living.

To sum up, it may be noted that *far from being leaders landlords became absentee parasites.* The zamindari tenure proved harmful to cultivators and stood in the way of agricultural progress. The cultivators suffered from rack-renting and insecure tenure. Frequent enhancement of rent and constant fear of ejection discouraged all enterprise on their part. Cultivation under zamindari tenure was much less efficient than cultivation by peasant proprietors. "Give a man the secure possession of a bleak-rock and he will turn it into a garden ; give him a nine years' lease of a garden and he converts it into a desert." H. Calvert has rightly said. "They generally take less care in preparing the crops, plough landless often, manure it less and use fewer implements upon it than owners. They grow less valuable crops, especially avoiding those requiring the sinking of capital in the land ; they make little or no effort at improving their fields ; they often keep a lower type of cattle ; they avoid perennials and bestow no care on tree."² Besides, there is an increase of non-

1. *Congress Agrarian Reforms Committee Report*, p.37.

2. H. Calvert, *Wealth and Welfare of the Punjab*, p. 198.

cultivating land-owners everywhere, even in the strongholds of cultivating proprietorship. This encroachment of landlordism has brought in its wake all the evils of spendthrift and inequitable land management.¹

Evaluation of the Permanent Settlement by the Land Revenue Commission of Bengal

The following arguments were advanced in favour of the Permanent Settlement in Bengal :

- (i) *Financially*, it had ensured to the State a fixed stable revenue without the necessity of incurring heavy expenses in connection with periodical reassessment ; and collection.
- (ii) *Politically*, it has secured the loyalty of the zamindars in the task of consolidating of British rule in India.
- (iii) *Socially*, it enabled the zamindars to act as the natural leaders of the ryots and to show their public spirit in a practical manner by helping the spread of education and sound ideas on sanitation, etc.
- (iv) *Economically*, it secured agricultural enterprise and prosperity and a resourceful peasantry which had shown a remarkable power of resistance in times of scarcity.
- (v) *Lastly*, it avoided the evils associated with the temporary settlements, such as the harassment of the cultivator at the time of revision, the expensive machinery required for settlement.

But all these advantages were brought at a heavy price. The Bengal Land Revenue Commission was appointed under the chairmanship of Sir Francis Floud to examine the existing land revenue system of Bengal with special reference to the Permanent Settlement and to appraise the advantages and disadvantages of the existing system. It was of the opinion that zamindari system had developed so many defects that it has ceased to serve any national interest. According to them the defects were :—

- (1) It had stereotyped the land revenue as a figure which is far below the fair share which the Government ought to receive from the produce of the land. The benefits of the introduction of more valuable crops and higher prices, the unearned increment due to the growth of towns and the development of trade and industry, the extra income created by the discovery and exploitation of the mineral resources of the province all went into the hands of the landlords. The Commission estimated the annual loss in this generation at anything between 2 crores and 8 crores.

1 R. K. Mukerjee, *Op. Cit.*, p. 148.

- (2) The community was deprived of its legitimate right to share in increasing prosperity of the zamindars, which was due not so much to the direct efforts of the landlords themselves as to social factors beyond their control such as growth of population, improved communication and rise in prices.
- (3) It involved government in the loss of revenue from minerals and from fisheries as these natural resources were not taken account at the time of permanent settlement, and in consequence they have been exploited for private gains without any co-ordinate plan.
- (4) It deprived government of intimate knowledge of rural condition such as raiyatwari system afforded as there was no direct contact with the cultivators. It was one of the greatest administrative defects that, throughout the last century, the administration had to carry on without any village maps, any record of rights, and without the wide knowledge of local conditions, and customs, which followed temporary settlement operations.
- (5) The zamindars not only failed to act as leaders of the rural community but they also actually oppressed the tenants by all sorts of legal exactions and became parasitic on the land. To be more definite, the evils of absenteeism, the management of the estates by unsympathetic agents or unhappy relations between the landlord and the tenant, and of the multiplication of the tenure-holders were at least as marked and as much on the increase than elsewhere.
- (6) It encouraged an excessive amount of sub-infeudation, creating a number of intermediaries between the zamindar and the actual cultivator which in some districts has reached fantastic proportions owing to the margin between the fixed land revenue and the economic rent of land. The land became nobody's concern.
- (7) The system led to an immense volume of litigation due to uncertainty regarding the respective rights and obligations of the parties interested in land, the unsatisfactory records in the zamindar's office.
- (8) So long as the zamindari and permanent settlement was allowed to continue, it would be impossible to give the cultivators (in zamindari areas) remissions of rent in times of natural calamities such as floods and droughts.
- (9) The rents paid by the tenants in the zamindari areas were not fixed on any scientific principle and had no recognised relation to the quality of the land or the value of the produce. The occupancy tenants were themselves degenerating into a class of rent receivers, and a large and

increasing proportion of the actual cultivators had no part of the elements of ownerships, no protection against excessive rents and no security of tenure.

In brief, the Land Revenue Commission said. The zamindar has become an incubus on the working agricultural propulation which finds no justification in the performance of any material service, so far as agricultural improvements are concerned and fails to provide for any effective means for the development of the resources of the land.¹ The Commission further emphasised that the "present system ought not to remain unaltered.....for whatever may have been the justification for permanent settlement in 1793, it is no longer suited to the conditions of the present time." The Commission observed. "The disease is far advanced and no half-measures will satisfactorily remedy its defect, i.e., given the actual cultivator a safe tenure, a fair rent and a guarantee that he would be left free to enjoy in full the fruits of his toil. Provided that a practicable scheme can be devised to acquire the interests of all classes of rent receivers on reasonable terms, the policy should be to aim at bringing the actual cultivators into the position of tenants holding directly under Government."²

The Commission recommended the following measures :

- (a) The abolition of the zamindari system and the acquisition by the government of the interests of all the rent receivers above the actual cultivators.
- (b) The payment of compensation at a flat rate for all interests, the rate of compensation being 10 or 12 or 15 times the net profit secured by the zamindar or the tenure holder.
- (c) Fishery and mineral rights should also be included in the scheme of state acquisition.
- (d) The imposition of an agricultural income-tax as a traditional measure until the scheme of state acquisition is effected, the proceeds of tax being earmarked for agricultural improvement.

(ii) Temporary Settlement

The tenure system based on the permanent settlement led to a number of evils such as absentee-landlordism, rack-renting, and economic serfdom of the tenants. All these results soon brought the fact to light that the main advantages claimed for a permanent settlement could be secured equally well by a temporary settlement for a fairly long period, the state reserving the right to enhance the land revenue assessment at the end of every such period. The British Government, therefore, adopted the policy of recognising one person with landlord rights and making him responsible for land revenue,

1. *Report of the Land Revenue Commission*, p. 37.

2. *Ibid.*, p. 42.

but it fixed the land revenue due from these estates on a temporary basis. This led to the origin of the Temporary Settlement which differed from the Permanent Settlement in two aspects *viz.*, the land revenue assessed on the estate was fixed only for a specified period and *secondly*, greater care had been taken to protect the rights of the parties below the persons recognised as landlords by government.

Under the Temporary Settlement systems were included (a) the Taluqdars of Avadh ; (b) the Landlords in Agra, and (c) the Malguzars of M. P.

(a) **The Taluqdars of Avadh.** They were originally the revenue farmers. The rulers of Avadh had been in the habit of entrusting the collection land revenue to the descendants of the dispossessed *Rajahs*, to bankers and capitalists and to military officials and by the time of the advent of the British these had consolidated their position and claimed landlord rights. Under the Avadh settlement, the *taluqdars* were recognised and settled with as zamindars but the land revenue assessed on their estate was made liable to periodical revision. The *Taluqdar* estates were increased by (i) the taluqdar's forcible encroachment on the land of his weak neighbour, (ii) the adoption of fraudulent means, (iii) sale deeds obtained by force, (iv) forced sales by auction for arrears of revenues, and (v) *bona fide* sales by the holders in order to raise the revenue demanded by revenue-farmers of *chakladars*.

(b) **Landlords in Agra.** In some parts of Agra the British came across territorial magnates who had risen to the landlord status by exercise of the revenue-farming rights under the Avadh kingdom. These were given only a limited over-lord rights over the estates of which they claimed to be owners. The village communities under them were directly settled with as the actual proprietors but the land revenue assessed on them was raised just so much as to allow for the payment of a *taluqdari* allowance of 10% of the land revenue to the overlord, direct from the government treasury.

(c) **The malguzars of the M. P.** They owned their landlord status to land revenue settlement with the British. The Maratha rulers had employed individuals known as *malguzar* and *patels* to collect land revenue from the various villages, and these in course of time strengthened their position and claimed landlord's rights. When the territory came under the Britishers, the British Government settled with the *malguzars* on whom they conferred proprietary rights. The land revenue due from the malguzar was liable to periodical revision and the rights of the root below the *malguzar* were more carefully protected.

EVALUATION OF THE TEMPORARY SETTLEMENTS

Benefits of the System

This system is said to have gained the following advantages :

- (i) The system of temporary settlement afforded the opportunity to the government to revise its rates of revenue and to enjoy the benefits of the increment in land values.
- (ii) In the raiyatwari areas, the cultivators had the chance of remission of revenue in times of famine or scarcity. They also had the liberty to give up their holdings or proportions thereof and thus had the choice either to retain the title or divert their resources to other fields of investment.
- (iii) The evils of landlordism are avoided, for the raiyats are directly under the state which was their immediate landlord, and, hence, the chances of oppression were minimised.

Temporary settlement was better than the permanent settlement because it struck a happy compromise between the legitimate claims of the State and the rights and convenience of agriculturists.

Demerits of Temporary Settlement

But on the other hand, temporary settlement suffered from certain drawbacks such as :

- (i) Under this system, the amount of revenue tended to become uncertain since its collection depended on monsoon conditions, which were themselves very uncertain and irregular.
- (ii) The benefits of a rise in prices of agricultural commodities, if any, went to the State and not to the raiyats at the time of reassessment.
- (iii) The cost of frequent revision of assessment was heavy and the visitation and harassment of the *raiya*ts were considerable.
- (iv) Under this system, the land tended to deteriorate towards the end of the settlement in consequence of the deliberate neglect on the part of raiyats or tenants in order to escape enhancement of assessment.
- (v) Though in the temporary settled areas the principle of assessment was not tax improvement and to charge only 50% of the net asset, the assessment amounted in many cases to a substantial part, or the whole, of the economic rent. The assessment of revenue depended on the arbitrary decision of the Settlement Officers and they were open to bribery and other unfair means.

The Britishers had brought about three major changes in the existing land relations.¹

1. Bhawani Sen, *Evolution of Agrarian Relations in India*, 1962, p. 77-78.

Firstly, they swept away clean all the remnants of the old village communities. The direct producers lost their traditional security without gaining any new one.

Secondly, they converted the landlords into estate owners, while they were not under the traditional system of land relations. "The result has been a layer of rights from those of the state as super landlord (or ultimate land owner) down through those of the sub-landlords (penultimate owners) to those of the several tiers of tenants. Both the state and the superior holders exercise the right to draw income from the soil in the form of rents, wherever possible the tenants also try to subsist by collecting rents from the working cultivators with rights inferior to their own."¹

Thirdly, under the new regime, for the first time in Indian history, land became a saleable commodity.

Under this new set up, three distinct classes emerged in India's countryside ; the landlords, the peasants and agricultural labourers.

The impact of this changed land relation on the working peasantry as well as on agriculture has been nicely summed up by Dr. Thorner. He says : "This complex of legal, economic and social relations uniquely typical of the Indian country-side served to produce an effect which I should like to call that of a *built-in-depressor*. Through the operations of this multifaced depressor, Indian agriculture continued to be characterised by low capital intensity and antiquated method. Few of the actual tillers were left with an efficacious interest in modernisation, or the prevention of such recognised evils as fragmentation. The pattern of landholding, cultivation and produce-sharing operated to hold down agricultural production. From the 1880's to the 1940's total output rose so slowly that it should not be too strong to speak of stagnation."²

In sum, therefore, it may be said that the tenurial system in India has been very defective. It gave rise to absentee landlordism, who never made any improvements on land, nor even supervised agricultural operations. It was interested in land only to the extent of extraction of exorbitant rent. The money raised by them did not result in capital formation but increased conspicuous consumption on women, wine and vices. The landlord symbolised oppression and tyranny. Agriculture was in fact, reduced to subsistence farming. It was disincentive-ridden.

Further the system inflicted injustices on cultivators in three ways. *Firstly*, cultivators working as tenants did not get a fair share of their produce. They are highly rackrented. *Secondly*, with no certainty about the tenure, particularly in tenancy-at-will, they suffer throughout their lives from insecurity, and they have to work under constant fear of eviction from land. *Thirdly*, a vast majority

1. D. Thorner, *The Agrarian Prospectus in India*, p. 11.

2. *Ibid.*, pp. 12-13.

have become landless or joined the ranks of tenants or agricultural workers. The richer cultivators acquired more land. Inequality of land ownership can be judged from the fact that the top 5 percent of rural households own more than what the bottom 80 percent own.

TENANCY LEGISLATION

Objectives of Tenancy Legislation

There has been a plethora of tenancy legislation right down from the British times to the present. The object of the legislation is to confer fixity of tenures, and to afford protection against rack-renting to the tenant thereby providing him an incentive to improve the land and obtain better crops from it. The tenancy legislation in India enacted from time to time, reveals that the main objects of these have been :

- (i) To put a limit on the enhancement of rents.
- (ii) To prevent arbitrary ejectments.
- (iii) To confer occupancy rights on tenants so as to make land heritable and also alienable.
- (iv) To provide for reduction or suspension of rent, exempt attachment for tools, cattle and seed.
- (v) To provide for reduction or suspension of rent where there is a reduction or suspension of land revenue.
- (vi) To provide for compensation to the tenant for any improvements he makes on the land.
- (vii) To protect the tenants from exactions like *salami*, *begar*, *veth* and *abwabs*.
- (viii) To create a class of peasant proprietors and to abolish all intermediaries standing between the State and the actual tiller of the soil.

Legislation for Intermediary Tenures

In permanently settled and temporarily settled zamindar areas, the legislative measures passed during the last 140 years resulted in recapturing the rights of occupancy by a great majority of principal raiyats of zamindars. The zamindars were only rent receivers in the *raiayatwari* lands and had no other right in land except where such lands were *sir*, *khudkash*, *nijijot*. The position of *jagir* and *inam* lands was different. In Hyderabad, Saurashtra, etc., the jagirdars did not have any proprietary right in the soil but were only assigners of land revenue ; while in other states they had full proprietary right in land. As compared to zamindari areas, the tenancy legislation in jagir areas was something unknown right upto 1947. The tenants of jagirdars remained tenants-at-will and paid heavy rents and were often ejected for its non-payment. Rajasthan was the first princely state to stop ejectment of tenants in jagir areas in 1949.

A large number of Acts were passed in different States to abolish the rights of intermediaries. Under the legislation, while no compensation was payable for the levy of full assessment on the land which were formerly called "alienated", compensation generally equal to the prescribed multiples of annual net rental income was payable for the abolition of the landlord's right to collect rent. The legislation applied to nearly 97% of the former intermediary area and it has been implemented in 92.4% of the area. The intermediaries whose interests have been abolished, numbered about 30 lakhs. More than 2 crore tenants have been brought into direct relationship with the state as a result of abolition of intermediary tenures.¹ As a result of the abolition of the intermediaries, the occupants have been brought into direct contact with the State, and uncultivated lands, forests, etc., have been acquired and about 1 crore acres of land has been distributed to landless agriculturists.

During 1961, legislation was undertaken for abolition of *Pattazhi Dewaswoms* in Kerala, *Patel Watans* in Gujarat and post-1936 inams and minor inams in Madras. In Assam, legislation has been enacted for acquisition of lands held by religious and charitable institutions.

Legislation for Raiyatwari Tenure

Prior to Independence. Tenancy legislation primarily aimed at regulating tenant-landlord relationship and not at putting an end to it. This was so, because, unlike the zamindar, *raiyyatwari* holders were full proprietors and were not holders of big estates. At present there are more than 50 tenancy enactments in force in different parts of the country to deal with these types of tenants : (i) tenants of home-farm lands settled with intermediaries after abolition ; (ii) sub-tenants or under-ryots in the ex-intermediary areas ; (iii) tenants holding land from ryots or land holders in raiyyatwari areas, and (iv) crop-sharers.

There are still large variations in the provisions of tenancy legislation with regard to security of tenure, regulation of rents and right of purchase for tenants.

Tenancy legislation enacted before Independence period can be divided into four categories :

(a) **Security of Tenure.** In Bombay, Punjab, H. P. and M. P. legislations were enacted for guaranteeing security of tenants. Such legislations prevented the ejection of tenants so long as they paid their rents regularly. With security of tenure, the tenants showed greater interest in land improvements.

1. Incidentally, it may be mentioned that Madras, Bombay and Hyderabad effected legislation in 1949 and 1950 ; followed by Bihar, M. P., U. P., Madhya Bharat and Assam in 1951 ; Orissa, Punjab, Saurashtra and Rajasthan in 1952 ; PEPSU, Vindhya Pradesh and Bhopal in 1953 ; and W. Bengal, Himachal Pradesh, Mysore and Delhi in 1954-55.

(b) **Fair Rent.** In Punjab, Hyderabad and Rajputana legislations were enacted which fixed maximum limits to the amount of rent payable to the landlord by the tenants. These legislations partially reduced the exploitations of the tenants by landlords. The tenant, because of the enforcement of fair-rent legislation, was better off and could undertake small investments for improving agriculture.

(c) **Legislations Providing Opportunities to Tenants to become Owners of the Land which they Cultivate.** In Bombay, Punjab, Delhi, Rajputana, Hyderabad and U. P. legislations were undertaken for providing tenants with rights of purchasing the holdings on which they cultivate. These legislations affected the production-efficiency of tenants because they were induced to take more loans with the hope of gaining ownership rights.

(d) **Compensation for Permanent Improvement.** In a few states legislations were enacted for the payment of compensation for permanent improvements undertaken on a farm by the tenants. Such compensation legislations coupled with security of tenure legislation gave rise to mild incentives for improvements of holdings cultivated by the tenants. But the absence of thorough institutional changes in agriculture, significant results could not be obtained.

After Independence, the primary aim of tenancy legislations has been to regulate rents to provide greater security of tenures to the tenants; and where the land owners have a large amount of land under their personal cultivation, to permit the tenants to purchase the land taken on lease. The measures relating to security of tenure restrict the ground on which a tenant shall be liable to ejectment. The grounds for ejectment are : (i) non-payment of rent ; (ii) performance of an act which is destructive or permanently injurious to the lands ; (iii) sub-letting the lands ; (iv) using the land for purposes other than agriculture and (v) resumption of land for personal cultivation by the landlord. Besides, in Andhra, Tamil Nadu, Karnataka, and Orissa the tenants are liable to ejectment from their entire area after the expiry of minimum period of lease prescribed under the law. The period of interim protection is extended from year to year and in some cases, for every six months. This creates uncertainty in the minds of tenants.

The provisions relating to right of resumption also differ from state to state. While there are states like U.P. and Delhi where no resumption was allowed for personal cultivation there are states like Jammu and Kashmir, Andhra, Tamil Nadu and Bengal where in certain cases legislation permits ejectment of tenants or crop-sharers from the entire area if the landlord wants to exercise the right of resumption.

LAND REVENUE

Since time immemorial it became a recognised attribute of the ruling power that as a matter of custom it had the right to the share

of produce. During the Hindu period, the king had no proprietary right in land, except the right to a share of the produce. His customary share was $1/6$ th of the produce and was known as customary *pargana rate*. Manu had recommended $1/6$ th to $1/4$ th of agricultural produce as the share of the State. The Mughals also had no proprietary right in land. They in their heydays introduced regular record and revenue accounts and took $1/3$ rd of produce. The Marhattas accepted these rates as the basis of this system, raising them to what they called *Kamal*, i.e., maximum on perfect rates payable by the best lands. With the appearance of the revenue farming system, the revenue farmer paid the government nine-tenths of the whole collection and kept the rest as his remuneration. But later on, the right of collecting land revenue for a Pargana was sold by auction to the highest bidders. With the introduction of the British rule in the country, the State was regarded as the supreme landlord and the assessment was made individually. The British fixed the maximum demand at one-half of the net assets, though actually it came to less than 30% of the rental.

The land revenue system, prevailing in India, may be classified from two angles :—

(i) Whether the land revenue was fixed once for all or whether it is revised periodically. The former was known as the *Permanent Settlement*, and the latter the *Temporary Settlement*.

(ii) The second basis of classification was the responsibility of paying the land revenue. On this basis we had three land revenue systems : (a) the *zamindari system* ; (b) the *raiyyatwari system* ; and (c) the *mahalwari system*.

The popular nomenclature of ryotwari, mahalwari and zamindari concealed transformation that had taken place during 150 years of practice. Shri Venkatasubbiah emphasizing this point mentions. "If Lord Cornwallis and Sir Thomas Munro, the respective protagonists of the zamindari and rayotwari, were to look at the systems in 1940, they would barely recognise them as such."¹

The co-existence of zamindari, ryotwari and mahalwari led to intermixing of characteristics but the three systems gravitated towards the tenancies of the zamindari system. Sub-letting and rack-renting became a common practice even in the ryotwari areas. The mahalwari system acquired the characteristics of the zamindari system in states like M.P. and U. P., where emphasis was laid on joint responsibility of the village for land revenue assessment while it acquired the characteristics of absentee landlordism of the ryotwari in Punjab where emphasis was on several responsibility for the payment of land revenue. Similarly, in *inams* and *jagirdari* areas, the zamindars demanded between a half and two-thirds as settlement.

1. H. Venkatasubbiah, *Indian Economy Since Independence*, p. 51.

LAND REVENUE ADMINISTRATION

The general features of the land revenue administration may be indicated under three heads :—

- (i) The preparation of the cadastral records,
- (ii) The assessment of the revenue, and
- (iii) The collection of revenue so assessed.

(i) Preparations of Cadastral Records

The land records include the village map, the revenue record and the record of rights. These records are prepared by means of a detailed field-to-field investigation and by inquiries from the villagers, the facts required for preparing the register of cultivating rights (or *khatauni*), agricultural statistics, and the changes in the field boundaries, so as to secure an exact amount of the cultivable lands, the extent of each kind of soil requiring its own rate of assessment. From this survey a map is prepared for each village showing the separate holdings and the area and nature of the cultivable and wasteland. To correspond with the village map, a field book (or *khaskra*) is usually prepared, and from these two (the village map and *Khaskra*) the revenue record, showing correct list of revenue payers with the amount shown against the names, is prepared. They are supplemented by statistical tables and returns illustrating the past history and the present condition of the village. A record of rights in the land such as the rights of landlords, co-sharers, sub-proprietors, occupancy tenants, as well as the rights created by mortgage sale, lease and so on is maintained. All these records are kept up-to-date by a system of public entry and registration of all changes. Thus the land records contain information about proprietary and tenancy rights in land, the revenue payable by each cultivator, the rent of each tenant, the area cultivated, the kind of crops grown, the nature and extent of irrigation, the customary rights of the village, the amount of rent and other dues actually paid to the proprietor and other details about the land in the village.

(ii) The Assessment of Revenue¹

The revenue is levied by means of cash demand on each unit assessed. The basis of assessment is defined under present arrangements in a variety of ways, as the 'net produce', the 'net assets', the 'economic rent', the 'rental value' and the 'annual value'. Sometimes two or more of these mean the same thing sometimes different meanings are attached in different places to one or the other..... The original settlements which were based on a great variety of factors, such as crops and soil values and the expenses of cultivation, have been replaced by resettlements, which are based mainly on the prices and general economic factors, "In carrying out these resettlements increasing degree of importance has been given to annual

1. *Report of the Land Revenue Committee in the Punjab*, p. 7.

value as ascertained by records of leases and sales and other similar factors."

Assessments under Different Systems have been like this :

(a) **Assessment under Zamindari.** Under the zamindari system, the demand was assessed on the village estate owned by a single proprietor or by a body of co-sharers. This demand was a definite sum payable in perpetuity or for a fixed term of years during which the whole or any increased profit which may accrue was enjoyed by the individual landlord.

The principle underlying the assessment in Bengal, Bihar and Orissa was that the State was entitled to the entire rental, except the expenses which would have to be incurred by the zamindar and a small margin of his profit. It was on this understanding that the State claimed 9/10 or 10/11 of the rental, leaving the remainder for the zamindar as a surplus for himself. Dr. Radha Kumud Mukerjee comments on this that "the Company based their revenue demand on their needs and not on the facts of actual zamindari receipts of ryoti rentals of those days. The assessment..... was based on the collection of previous year and there is nothing to show that the proportion which the revenue bore to the gross assets of each estate had ever been ascertained with any approximation to authority."

(b) **Assessment under Ryotwari.** Under the ryotwari system, the assessment was on each field as demarcated by the survey. The assessment was on land and did not depend on the kind of crops grown. The soil was first classified according to the capacity, and then the normal yield as calculated on each class of soil after a series of experiments, and this was then converted into money value not at the current rates which may be abnormal, but at the average of prices prevailing in the preceding 20 years (excluding famine years).

(c) **Assessment under Mahalwari.** The *Mahalwari system* (particularly in the Punjab) aimed at fixing a moderate revenue to be paid by each village as a whole. The basis of assessment was 'net assets'. The maximum revenue demand which was originally fixed at one-half of the net assets was reduced to one-fourth in 1928 and net assets were defined to mean the estimated average annual surplus produce of an estate or group of estates after deduction of the ordinary expenses of cultivation. The net assets were calculated on the basis of rents paid by the tenant cultivators who usually pay a fixed share of the produce. The produce estimate was based on several factors, viz., the average of all crops sown and matured, the average yield per acre of each of those crops, the average obtainable in the village and the actual share of the gross produce received by the landowners. The net assets were thus calculated upon *landlord's rental* and not upon *owner cultivator's* profits. The assessment for the circle having thus been determined was thereafter distributed village by village and all the holdings in due consultation with landlords.

(iii) Collection of Revenue Assessed

Owing to the abject poverty of the cultivators and practice of obtaining two main crops during the year, the land revenue is generally recovered not by a single annual payment but in instalments, the dates and amounts of which are determined according to local conditions so as to suit the convenience of the revenue payers. For the recovery of the sums or arrears not paid by the fixed date the Government has extensive powers conferred by law including compulsory attachment and sale.

Though the assessment is fixed with reference to average seasons and conditions during the period of the settlement, exceptional disasters, widespread or local, such as floods, blight, total failure of rains or of the sources of irrigation, or collapse of prices of agricultural produce are apt to upset all calculations. In these circumstances relief graduated according to the degree of crop failure is necessary and may take the form of suspension or remission (partial or total). The Government of India has laid down the principles to be followed by local Government, in case of suspensions or remission of land revenue according to which relief will not ordinarily be required when there is half a normal crop. The total relief is to be granted where the crop is less than a quarter of the normal. No relief is to be ordinarily given to the revenue payer of the landlord class, unless, it could be ensured by legislation or otherwise that a proportionate share of the relief is extended to the actual cultivators of the soil. The suspended revenue may be recovered or remitted according to the nature of the succeeding harvest.

The Incidence of Land Revenue

The incidence of revenue charges varies according to the nature of settlement, the basis of assessments, the class of tenure and the type of holding from one part to another. Owing to the variations in the systems followed between States and even between one district and another, it is not possible to obtain any general idea about the land revenue charges. Five possible criteria may be applied, viz., (1) the ratio borne by the land revenue to the population ; (2) the ratio borne by the land revenue to the occupied area, *i. e.*, the average assessment per hectare ; (3) a comparison of assessment per soil unit ; (4) the ratio borne by the assessment to gross or net produce ; and (5) the ratio borne by the assessment to rents or rental value. The Taxation Enquiry Committee accepted the last as the least unsatisfactory method but, even in this respect, owing to the absence of the full and reliable data, they were unable to arrive at any definite conclusion regarding the actual burden of assessment in different States.

Land revenue was the mainstay of the tax revenue of the States in the past. It contributed 70% of the total revenue about a hundred years ago, now it contributes only 11 % of the total tax revenue of all the States in the country. At present its importance as a

source of revenue is declining. The declining trend has continued throughout the planning era.

During the First Plan Period, land revenue contributed to 20.3% to the total tax revenue of the states. During the Second Plan period, it contributed at comparatively lower rate i.e. 14.5%. During the Third Plan period, the contribution was still lower at 9.8 per cent. In 1977-78, it was less than 4 percent. The land tax is being abolished completely or partially in most states. This is evidenced from the following tables.¹

Receipt of Land Revenue (Rs. lakhs)

Years	Total Revenue	Land Revenue	% of land revenue to total revenue
1955-56	53,932	7,839	14.5
1956-61	101,441	9,953	9.8
1970-71	337,040	11,261	3.4
1971-72	404,472	10,075	2.5
1972-73	491,235	9,293	1.9
1973-74	555,200	15,701	2.8
1974-75 (A/cs)	643,151	16,051	2.5
1975-76 (RE)	762,007	19,612	2.6
1976-77 (BE)	825,724	19,932	2.4
1977-78 (BE)	—	23,000	3.7

Although the yield from land revenue has increased in absolute terms it is not due to any upward revision of land revenue rates but for various other reasons such as at the cost of the zamindar and also due to increase in area under cultivation. The burden of land revenue has also fallen due to rise in real income of the cultivator on account of increasing productivity of land and rise in the price of agricultural products. It is worth noting that land revenue formed 4 per cent of the income originating in the agricultural sector in 1938-39. Since then it has declined, in 1950-51, the proportion was, 1.2 and in 1961-62, it rose to 1.5 but again fell to 0.8 percent in 1965-66.

Land revenue varies a great deal in different states, as would be seen from the table given below.²

1. *Indian Agriculture in Brief*, 1974, p. 19. and for 1977, p. 20.

2. *Indian Agriculture in Brief*, 1977, p. 20.

Total Revenue, Land Revenue & Agricultural Income Tax, 1976-77
(Lakh Rupees)

State	Total Revenue	Land Revenue	Percentage of col. 2 & 3	Agricultural Income Tax
1	2	3	4	5
Andhra Pradesh	65,615	3,328	5.1	—
Assam	16,755	475	2.5	469
Bihar	50,203	2,740	5.5	20
Gujarat	48,046	700	1.5	—
Haryana	23,636	470	2.0	—
Himachal Pradesh	8,720	87	1.0	—
Jammu & Kashmir	15,133	56	0.4	—
Karnataka	51,394	700	1.4	225
Kerala	38,275	312	0.8	550
Madhya Pradesh	58,686	2,331	4.0	—
Maharashtra	112,174	1,936	1.7	35
Manipur	3,959	40	1.0	—
Meghalaya	3,500	2	0.6	—
Nagaland	5,012	7	0.1	—
Orissa	31,135	519	1.7	—
Punjab	33,934	127	0.4	—
Rajasthan	39,712	1,050	2.6	1
Tamil Nadu	57,563	212	0.4	226
Tripura	3,734	46	1.2	1
Uttar Pradesh	95,042	40	4.2	—
West Bengal	59,623	781	1.3	130
Total ...	825,724	19,932	2.4	1,666

From this table it will be apparent that poorer the state, the larger the share of land revenue in the total tax receipts. These states are generally underdeveloped and require heavy injections of resources for their development.

Dr. Khuro's analysis of the declining trends in land revenue deserves mention here. He observed : "The internal value of the rupee has fallen considerably between 1939 (whole-sale price index—100) and 1959 (index 1915) so that the real value of tax received by the Government has declined steeply. *Secondly*, yields per acre have been rising during the 1950's and since upward revisions of land revenue have been infrequent and meagre, land revenue collection has declined in this decade as a proportion of output. *Thirdly*, since the

price level of farm produce has increased considerably, land revenue has come to constitute an even smaller share of the money value of output than of output in real terms. *Fourthly*, as big farmers market larger surplus both absolutely and relative to their output than the small farmers, the distribution of farm incomes in a general inflationary set-up tends to become increasingly favourable to big farmers and warrants higher rates of land revenue in their case. And *finally*, since inter-sectoral terms of trade have been gradually moving in favour of farmers and against non-farmers between 1940 and 1951 and again between 1954 and 1961, there is a presumption that the tax paying capacity of the agricultural sector has increased proportionately more than that of the non-agricultural Sector.”¹

Defects of the Land Revenue System

The Indian land revenue system suffers from a number of defects which may be enumerated as below :—

- (i) Save in some states, not only the burden is oppressive on the majority but the incidence of it is also not uniform and the inequalities do not bear any relation to the productive capacities of the land.
- (ii) It violates the law of equity as there is no minimum exemption and no progression. However, many States have introduced agricultural income-tax and incomes besides the land revenue. Assam, Bihar, J. & K, Kerala, Maharashtra, Karnataka, Rajasthan, Tamil Nadu, U. P. and West Bengal account for most of (97.5%) the collections under agricultural income-tax.
- (iii) The system lacks elasticity as the land revenue is fixed permanently or for a long period ranging from 20 to 40 years.
- (iv) The basis of assessment is unjust and complicated, profits should be the basis. No allowance is made to the labour of the cultivator and his family.
- (v) The land revenue is assessed not on the actual tiller of the soil but on those who have turned absentee landlords. This has given rise to a vicious tenancy system.
- (vi) The method of revenue collection is also very rigid. The inelastic nature of the time of payment and rigidity of assessment are responsible for the deterioration in the economic conditions of the ryots.

Whatever be the nature of land revenue, one thing is clear that it must be adjusted within the taxable capacity of the cultivators and it must be levied in accordance with the ‘Equity’ canon of taxation.

1. A. M. Khusro, “Taxation of Agricultural Land—A Proposal” *Economic Weekly*, Annual Number, February, 1963, p. 257.

Abolition of Land Revenue

The Governments of Madhya Pradesh, Tamil Nadu, Karnataka, Orissa, Punjab, Rajasthan and U. P. have either decided to abolish land revenue or agreed in principle to do it. M.P. has abolished land revenue on holdings of 7.5 acres or less and those in respect of which the assessment did not exceed over Rs. 5 per annum. This was expected to involve a loss of revenue of about Rs. 7 crores during the Fourth Plan period. The Government of Tamil Nadu withdrew the surcharge on land revenue and water rates imposed in 1965. This was to involve a loss of Rs. 6.6 crores over the Fourth Plan period. In Karnataka, surcharge on land revenue was discontinued. This involved a loss of Rs. 6 crores per annum. The Orissa Government decided to abolish land revenue, the loss in revenue was to be of the order of Rs. 18 crores over the Fourth Plan period. Punjab decided to abolish land revenue on holdings upto 5 acres, together with the surcharge leviable thereon. This was expected to involve a loss of Rs. 2.7 crores over the Fourth Plan period. The Rajasthan Government also decided to exempt small holdings from land revenue, the estimate of loss in revenue was not made. The U.P. Government withdrew surcharge on land revenue, from 1967-68 rabi crop, expecting to involve a loss of Rs. 20 crores. The land tax has now been abolished completely or partially in most states.

TAXATION ON FARM INCOME

The taxation of agriculture has a critical role to play in the acceleration of economic development since it is only the imposition of compulsory levies in the agricultural sector itself which enlarges the supply of savings for economic development."¹ It is, therefore, quite justified that agricultural income should be taxed on the ground of raising marketable surplus from the agricultural sector.

Till 1938, agricultural income in India was not taxed except for periods between 1860-65 and 1869-73. In 1935, State Governments were authorised to levy a tax of agricultural incomes. Bihar availed of the opportunity first of all. Now the States of Assam, Bihar, J. & K., Kerala, Tamil Nadu, Maharashtra, Karnataka, Rajasthan, U.P., Orissa and W. Bengal levy a tax on agricultural incomes. However, the applicability of income tax to agricultural income is not uniform. For instance, agricultural income tax is applicable to plantation crops only in Assam, Kerala and Tamil Nadu. In Maharashtra, almost all the entire revenue to the state from this tax is from sugar plantations. In J. & K., commercial crops alone are accessible to tax. In Karnataka both plantation as well as farm incomes are liable to tax.

In some States (like Rajasthan) it has been levied in the form of 'cess of land revenue'; while in others like U.P. it is in the form of large holding tax.

1. N. Kalder, "The Role of Taxation in Economic Development," quoted by E. T. Mathew in *Agricultural Taxation and Economic Development* p. 5.

The exemption limits differ from State to State, ranging from Rs. 3,000 to Rs. 6,000, the general exemption being Rs. 3,500. It varies from Rs. 5,000 in Orissa, to Rs. 3,600 each in U.P. and Kerala; to Rs. 3,500 in Tamil Nadu; and Rs. 3,000 in Bihar. The maximum being Rs. 36,000 in Maharashtra. In W. Bengal it is levied on 82 bighas of land; in Karnataka on 50 acres of the lowest class of land or an extent equivalent to one or more of the class. In M.P. it is levied on 50 acres of tractorised and 100 acres of non-tractorised land.

The total revenue from this source amounted to Rs. 24.6 in the First Plan (out of a total revenue of the States of Rs. 1,257.11 crores). It rose to Rs. 42.5 crores in Second Plan (total Rs. 1,896.9 crores); and to Rs. 48.0 crores in the Third Plan (total being Rs. 3,339.9 crores). During the Plan holiday, it has ranged between Rs. 10.5 crores in 1966-67, to Rs. 10.6 crores in 1967-68, to Rs. 11.2 crores in 1968-69 to Rs. 11.4 crores in 1973-74 and to Rs. 16.6 crores in 1976-77.

Although the yield from agricultural income-tax in absolute terms has shown an upward trend from Plan to Plan, its relative contribution to total revenue has been diminishing, from 2.0% of the total revenue during First and Second Plans to 1.4 per cent in the Third Plan and then to 0.8 per cent each in 1966-67 and 1967-68 and it rather stabilised at 0.7 per cent since 1968-69, and fell down to 0.3 per cent in 1970-71 and 1973-74 it was 0.2 per cent.

State-wise break up of the revenue accruing from agricultural income-tax for the period 1966 to 1974 is given below :

Agricultural income-tax (In Crores of Rs.)

	1966-67	1967-68	1968-69	1973-74	1976-77
Andhra	—	—	—	—	—
Assam	2.74	3.09	3.24	3.36	4.69
Bihar	0.13	0.38	0.39	0.48	0.20
Haryana	—	—	—	—	—
Gujarat	—	—	—	—	—
J. & K.	—	0.01	0.01	—	—
Kerala	2.81	2.80	2.80	3.58	5.50
M. P.	—	—	—	—	—
Tamil Nadu	1.46	1.27	1.57	1.95	2.26
Maharashtra	0.3	0.20	0.35	0.10	0.35
Karnataka	1.51	1.69	1.55	1.50	2.25
Orissa	0.07	0.06	0.07	—	—
Punjab	—	—	—	—	—
Rajasthan	0.01	0.02	0.01	—	—
U.P.	0.28	0.27	0.47	0.12	—
W. Bengal	1.22	0.77	0.87	1.00	1.30
Total, India ...	10.54	10.56	11.38	12.10	16.66

It is apparent that Assam, Kerala, Karnataka, and Tamil Nadu account for about 70 per cent of the total collection where plantation is predominant. The revenue from agricultural income-tax is negligible in Bihar, Maharashtra, West Bengal. The States of Andhra, Orissa, J. and K., Gujarat, M. P., and Punjab do not impose such tax.

It may be noted that agricultural income tax is not a lucrative source of revenue in most of the States. This is due to a number of factors : (i) In most cases, exemption limit is very high, generally between Rs. 3,000 to Rs. 6,000 ; and it differs significantly among the States especially where the size of holding is the basis. In States where the exemption limit is quite high the agricultural income tax has been more or less a kind of surcharge on land revenue in the higher income brackets, (ii) The laws governing land management system are such that big landholders can easily evade tax by distributing their holdings among their sons and relations. (iii) In a number of States, agricultural income tax was introduced more as a financial expediency rather than as a calculated measure to bring agricultural income on par with non-agricultural income. Consequently, the administration of agricultural income tax is loose and collection is made difficult because agriculturists do not maintain accounts. This is specially the case with plantations. (iv) The method of evaluating farm income has not been distinctly defined and is based occasionally on unwarranted assumptions and arbitrary estimates. (v) Weather uncertainties also play a considerable role in reducing the collection of tax.

Case for Agricultural Income tax

Various arguments have been offered for imposing of income-tax on agricultural production. Some of them are :

(1) According to the *Taxation Enquiry Commission*, "the incidence of taxes on the rural population is less than half of what it is on the urban population. The expenditure group with Rs. 1.50 in the agricultural sector paid in 1953-54, 2.21% in taxes whereas the group with the same expenditure in urban sector paid 3.3% in taxes or 33% greater than the rural sector. The higher one goes in the expenditure group, one finds agricultural families to be relatively in a more favourable position. Beyond the level of an annual expenditure of Rs. 3,600 the disparity widens rapidly, for instance, a non-agricultural family earning Rs. 5,542 would pay nearly 74 per cent more than an agricultural family with the same annual expenditure. A non-agricultural family earning Rs. 76,500 per annum would pay as taxes 51.5 per cent of its income as against only 5.3 per cent in the case of an agricultural family."¹

1. Dr. Rao has found that "holdings below 200 acres (having an income below Rs. 6 500) are taxed much more than their urban counterparts. Holdings above 20 acres (having an income around Rs. 14,000 or above are taxed much less as compared to similar urban groups.

According to another estimate, the total direct tax incidence on the agricultural sector is to the tune of Rs. 141.40 crores against Rs. 631.70 crores on the non-agricultural sector.¹ Per household incidence of indirect taxes was 4.4 per cent (of consumer expenditure) in the rural sector against 9.3 per cent in the urban sector in 1958-59². Therefore, it is desirable to devise "ways and means to tax the agricultural sector adequately and land revenue in particular because in developing countries adequate taxation of the farming sector is more important than it is in advanced countries since it has a special role to play to smoothen the progress of development."³ The rural people should also share the same burden of taxes as their urban counterparts. What we suggest is that the rates of tax should be on progressive system i.e., lower incidence on smaller holdings and higher incidence on higher holdings. Holdings upto 2.5 acres or those having agricultural income upto, say, Rs. 4,500 may be exempted from land tax. Those having higher income, may be taxed at a graded rate, ranging from 5 to 15 per cent. The Fourth Plan observed: "It will be necessary to revise the land revenue both for securing the additional resources and for introducing an element of progression in their incidence on holdings of different sizes."⁴ This will reduce both under-sectoral and inter-class disparities.

(2) Additional taxation of the cultivators is also justified by the relative increase in the taxable capacity of the agricultural sector. There was an increase of 89 per cent in the per capita income in the agricultural sector compared with 51 per cent in the non-agricultural sector in 1965 over 1956 figures. Besides, the Green Revolution and the IADP programmes have helped agriculture to move out of subsistence to commercial farming. As such the traditional system of agricultural taxation which is generally through a low fixed flat rate of land revenue, has become "outmoded, inadequate and irrelevant". Hence, a system of progressive taxation of agricultural income is urgently called for.

The benefits of this increase had largely gone to cultivators owning large holdings. On economic grounds, therefore, this sector should be taxed at a higher rate compared with those who own small holdings. Surplus income should be mopped up. "The transition from a level of savings and investment that spells stagnation to one permitting a tolerable rate of economic growth cannot be achieved unless agriculture makes a significant net contribution to capital formation in expanding sectors."

1. V. P. Gandhi, *Tax Burden on Indian Agriculture*, 1966, p. 86.
2. *Report on Incidence Taxes, 1958-59*, Ministry of Finance, Government of India.
3. U. K. Hicks, *Development from below*, p. 321.
4. *Fourth Five Year Plan*, p. 88.

(3) The agricultural sector has been receiving substantial funds, out of the total development expenditure, which results into increased benefit and welfare of this sector. During the Third Five Year Plan period, 26.7% of the total expenditure was allotted to rural sector, though during the first two Plans, it was 24% and 18% respectively. Besides, there has been an increasing tendency of expenditure in the rural sector. Voluntary saving and investment in the rural sector are very meagre and, therefore, these additional resources must be tapped up.

So on the basis of increased expenditure on rural sector, agriculture must contribute a large share. "Economic development in Asia is likely to benefit agriculture directly and thus increase land values. As this increment is directly the result of development projects benefitting agriculture, the State may finance the cost of development partly by charging the beneficiaries.

(4) According to the N. S. S., in the agricultural sector people do save as much as 2.7 per cent of their incomes and spend as much as 10.36 per cent of the consumption expenditure on items other than food such as ceremonials, intoxicants, refreshments, tobacco, pan etc. Hence, if Indian farmers are taxed they would not be put to any burden.

Shri Morarji Desai rightly said in his Budget Speech of Feb. 28, 1969. "Those who benefit by the substantial investments in agriculture, including research, irrigation facilities fertilizer plants, rural electrification, credit facilities and the support prices should contribute a part of their prosperity towards the cost of development in general. This is all the more so when the benefits of improved technology cannot yet be shared by the majority of our farmers. If the benefits of the new agricultural technology are to be carried progressively to a growing proportion of our farmers, the resources needed for this purpose should come at least in part from the beneficiaries of the process."

The Prospective Planning Division of the Planning Commission has suggested that additional agricultural taxation should be introduced to serve three objectives, viz ; (i) to secure larger investible and marketable surpluses from agriculture ; (ii) to provide an incentive to raise agricultural output ; (iii) to introduce an element of progressive taxation so as to make it more equitable.

For achieving these objectives, the Division suggested the introduction of a progressive surcharge on land revenue, surcharge on area under commercial crops, a purchase tax on commercial crops, and a tax on livestock.

Some of the economist suggested that the land revenue rates should be raised from the present levels and that progression should be introduced. Others suggested that the regressive land tax should be abolished totally and if should be replaced by a progressive agricultural income tax.

Committee on Taxation of Agricultural Wealth and Income

In view of the controversy over the issue, the Chief Ministers Conference on Resource Mobilization, held in 1971, recommended the appointment of an Expert Committee to examine the centres proposal to link or merge income tax with agricultural income tax. Accordingly, the Committee on Taxation of Agricultural Wealth and Income was appointed under the Chairmanship of Dr. K. N. Raj in February 1972 to examine the question of taxation of agricultural wealth and income from all aspects. It submitted its report in October 1972.

The Committee pointed out that the present land revenue system suffers from two basic defects, viz;

- (i) the incidence of land revenue in relation to the productivity of land is not uniform over different parts of the country, as the land revenue settlement was done under different systems and at different times in different parts of the country.
- (ii) the land revenue is assessed at a flat rate per hectare and, therefore, was not progressive.

To remove these defects the Committee recommended that Agricultural Holdings Tax (HAT). It is tax on net farm business income i.e., on the net rateable value of agricultural land holding. The (HAT) is to be imposed, according to the Committee, on operational holdings, i.e., land owned by the farmer *minus* any part of his land leased out or mortgaged to others *plus* any land leased or mortgaged by him from others. The basis of assessment is to the family and not the individual consisting of husband, wife, and minor children.

The implementation of the AHT was recommended to be in two phases (i) the replacement of the present land revenue by the AHT on all operational holdings with rateable value of Rs. 5000 or more ; and (ii) extension of the (AHT) to all other operational holdings with rateable value below Rs. 5000. The additional resources likely to be raised from the (AHT) have been estimated to range between Rs. 150-200 crores per year.

The salient features of the (AHT) are :

- (1) The assessment of the (AHT) will be done on the basis of certain objective criteria and procedures that will be uniform throughout the country and will ensure equity in its incidence.
- (2) The (AHT) takes into account the differences in productivity of land all over the country.
- (3) The tax is progressive, as it falls heavily on holding with large rateable value.

- (4) The tax is assessed on operational holdings and protects the tenancy rights on land.
- (5) The tax takes the family as the basic unit of assessment. For trusts, joint stock companies and other non-family holdings there are special rates and procedures.
- (6) The year of assessment (1st July to June 30).

The recommendations of the Committee have been criticised on more than one count. The main being :

- (i) No consideration has been given to administrative difficulties and cash involved, as the implementation would require a vast army of tax collectors and a large number of courts to settle assessment of (AHT) disputes.
- (ii) Since there is found a lack of records relating to occupational holdings, incorrect reporting of aggregate holdings of families, deliberate misreporting of crop patterns, problems of benami holdings and their benami transfers.
- (iii) The (AHT) is based on operational holdings and therefore, the rental income from agricultural taxation is left out. Dr. Hanumantha Rao says, "Since the case for taxing rental incomes is even stronger than the taxation of farm business income, the Committee's recommendation in this respect, if accepted, would introduce a fresh element of inequity in fact perversity in the system of agricultural taxation in India."
- (iv) The procedure suggested for the computation of rateable value is defective. According to the Committee the steps involved are :
 - (a) a thorough survey of the soil with regards to its nature, suitability, to the various crops, irrigation requirements of different crops, etc ;
 - (b) a thorough survey of the climatic conditions in different parts ;
 - (c) division of the country into soil-climatically homogeneous tracts ;
 - (d) Crop-wise production for the past 10 years for each tract and crop-wise prices for the last 3 years ;
 - (e) preparation of Farm Management Studies in each soil climatic district to compute crop-wise paid out costs of cultivation for each tract ;
 - (f) actual assessment of operational holdings. All these procedures will involve heavy costs. Further, the availability of statistics and relevant data at the right time are likely to pose a formidable problem to the implementation of the (AHT.)

- (v) The (AHT) contradicts the Committees own principles guiding the agricultural tax policy i.e., "The incidence of direct taxation should be broadly the same an comparable income and wealth groups irrespective of the sources of such income and the farms in which wealth is held." According to this principle, the Committee should have recommended that all land holders getting Rs. 5000 or more from agriculture should pay (AHT) roughly at the same rate as those in the non-agricultural sector pay income tax ; and land holders getting less than Rs. 5000 should have been exempted, as their counter parts in the non-agricultural sector. But contrary to it, the Committee has recommended (AHT) for all land holders with net rateable value of Rs. 600 and above and for all farm business income below Rs. 600, the (AHT) has been recommended at a uniform rate of Re. 1 per holding.

The State Governments rejected the proposal of (AHT) on the above grounds.

In sum, while considering over the issue of progressive agricultural income tax, it is necessary to take into account various economic and administrative difficulties in imposing such a tax. The farm income for purpose of levying tax on it is difficult to determine. Wide fluctuations in the prices of different crops and their output leads to fluctuations in the farm income, leading to indefinite basis for taxation. Different systems of land holdings and different kinds of tenancies make the location of the assessee every difficult. Finally, the cost of collection of agricultural income tax may be very heavy since, the farmer assesses are scattered over the country. In spite of these practical difficulties, the progressive agricultural income tax is justifiable on the ground that while there is progression in the taxation of non-agricultural income, there is no such progression in the taxation of agricultural income. Hence, the need is for tapping additional revenue from agriculture for purposes of economic development of the country.

3

Land Reforms

Need for Institutional Changes

That the present land system prevailing in India retards agricultural efficiency and makes it impossible to effect technological improvements in production need not be over-emphasised.¹

The main defects of India's agrarian structure, according to the Planning Commission, have been :

- (i) the existence of a large number of intermediaries between the State and the cultivator.
- (ii) The existence of a large proportion of land under tenancy system. The 1961 census revealed that about one-fourth of the cultivated land is under tenancy. In certain regions the incidence may be as high as 40 per cent. About one-half was under Zamindari and other intermediary system.
- (iii) Insecurity of tenure among small cultivators due to indebtedness, mortgages into possession, and absence of ownership rights which prevented the cultivator from effecting permanent improvement on land ; and sub-leases in *raiyyat-wari* and *zamindari* areas, which were oral and terminable at will.

1. Dr. Mukerjee has observed that, "the standard of living of the Indian peasants cannot rise until a change in land system supplies the essential economic basis of more efficient peasant farming. Neither scientific agriculture nor co-operation can make much headway unless we reform the land system."—R. K. Mukerjee, *Land Problems of India*.

As far back as 1899 even Dr. Voelckar pointed out that defective land system is one of the causes of the low productivity of agriculture in India."

The National Planning Committee observed in the same vein that, "ownership in all forms of natural wealth must belong to and vest absolutely in the people of India collectively.....No intermediary parasites—zamindars, talukdars, malguzars, etc., should be recognised.....All rights belonging to these classes be bought out and steps taken to consolidate all holdings into standard units and minimize the human effort involved. No sub-division of agricultural land by any incidence of inheritance, mortgaging, or alienation should be permitted."—N. P. C. *Report on Land Policy and Agriculture*, pp. 48-49.

- (iv) a high rate of rent which leaves little incentive to cultivators to produce more particularly in case of crop-sharing ;
- (v) small and fragmented holdings disabling improvements in techniques of cultivation ;
- (vi) uneven distribution of land which leaves a large section of the rural population either without any land or with holdings too small for profitable cultivation ;
- (vii) excessively low yield per hectare and prevalence of poverty in agricultural sector ; and
- (viii) lack of effective organisation for the completely disorganised peasantry at the village level.

According to the U. N. O. Report, the present agrarian system acts as a powerful obstacle to economic development in three ways. *Firstly*, the tenant has little incentive to increase his output since a large share accrues to the landowner who incurs no cost. *Secondly*, very small margin is left with the actual cultivator and this amount is quite insufficient to provide for capital investment on the land. *Thirdly*, it means that wealth is held in the form of land, and that the tenants secure no benefit of working with better equipment or with better seed.¹ In a word, under the present agrarian system, the *landlords grew richer, the intermediaries continued to flourish, the State was deprived of his share of legitimate increase in revenue and the cultivator-tenants lived a hand to mouth existence.*²

When India became Independent it was faced with the problem of antiquated system of land ownership which it had inherited out of its history and its past. Many of these systems were unjust and oppressive, demanding high rents from farmers and destroying the incentives to improve farms and farm methods. Besides, there were gross inequalities in land ownership. Insecure tenures not only perpetuated the social and economic injustice, but also turned out to be formidable stumbling blocks in the path of modernisation of Indian agriculture.

A high-powered Committee with Shri J. L. Nehru as chairman reported in 1948 that "All intermediaries between the tiller and the state should be eliminated, and all middlemen should be replaced by

Shri M. B. Nanawati observed, "No scheme of Agricultural planning for the post-war period would achieve material results if it overlooks the adverse effects of a defective land-tenure system on the productivity of the land." He further opined, "Zamindari institution is too obsolete to fit into any government organisation. Any attempt to enforce such a measure would not only fail to benefit the people but will meet with friction and disharmony at every step and be a perpetual source of embarrassment to the Government."—Nanawati, M. B. and Anjaria, J. J., *Indian Rural Problem*, 1948.

1. U. N. O., *Land Reforms. Defects in Agrarian Structure as Obstacles to Economic Development*, 1951, p. 18.
2. *Report of the Congress Agrarian Committee*, p. 8.

non-project taking agencies.... Land should be held for use as a source of employment in the case of minors and the physically handicapped persons, a share of the produce of the land should be given to them..... The maximum size of holdings should be fixed and the surplus land over such a maximum should be acquired and placed at the disposal of the village cooperatives. Small holdings should be consolidated and steps should be taken to prevent further fragmentation."¹

The *Agrarian Reforms Committee*, under Shri J. C. Kumarappa provided the guidelines for the formulation of land reform policies in Independent India. The Committee recommended that "(i) all intermediary interests should be abolished and the land should belong to the tiller. (ii) Leasing of land should be prohibited except in the case of widows, minors and other disabled persons. (iii) All tenants who had been cultivating lands continuously for a period of 6 years should be granted occupancy rights. (iv) The tenants should have the right to purchase the holdings at reasonable price to be determined by a land tribunal. (v) The agrarian economy should provide an opportunity for the development of the farmers' personality.

The Committee further emphasised that :

- (i) there should be no scope for exploitation of one class by another ;
- (ii) there should be maximum efficiency of production and
- (iii) the scheme of reform should be within the realm of practicability."²

The most radical view on the agrarian question is perhaps reflected in the recommendations of the *Committee on the Size of Holdings* (of the Land Reform Panel of the Planning Commission), which stated that : "Among all resources, the supply of land is the most limited and the claimants for its possession are extremely numerous. It is, therefore, obviously unjust to allow the exploitation of any large surface of land by a single individual unless other overwhelming reasons make this highly desirable. Further, in the light of the available supplies of land, labour and capital, it would be undesirable to encourage capital intensive method of production. Moreover, whatever the economies of large-scale management, they should, in the congested state of our countryside accrue to collective or co-operative bodies of cultivators rather than an individual family. Lastly, in the context of the current socio-political climate redistribution of land would appear to be imperative."³

"A successful agrarian reform which strengthens the economic position of the rural population undoubtedly also helps to develop

1. Malviya, H. D., *Land Reform in India*, p. 80.

2. *Ibid*, p. 80.

3. Quoted by B. Sen, *Evolution of Agrarian Relations in India*, pp 190-191.

the qualities of intellect, commonsense, morale, energy, resourcefulness and prudence which are necessary to economic progress.¹ For necessary spirit and drive can come only when the entire agricultural population is involved in the process of change and development. The people must be convinced not only that general progress is possible, but that it is actually under way.²

In the rural economy, "the agriculturist is the lynch-pin of the whole social chariot," and in order to revitalise the rural economy, it is he who should be given a sense of participation, Sri Chester Bowles emphasizing this factor writes: "Without awakening enthusiasm and co-operation of masses, often buried under centuries of hopeless repression development is impossible. This underscores.....the need for a reasonable equitable and speedy distribution of tangible benefits and the cultivation of a widespread sense of personal participation."³

Nature and Objectives of Land Reforms

In the current ideology, in its widest sense, agrarian reform is thought of as including, apart from redistribution of land, many other measures, tenancy and other land management reform, agricultural extension, etc.⁴

The basic objective of land reform in India has been the creation of a system of peasant proprietorship. "Land to the tiller" has been the motto. Through the redistribution of land by applying ceilings on land holdings the idea has been to build up a vigorous independent peasantry consisting of small farmers and then to aid this farmer class with extension of credit and distribution facilities, largely through a network of co-operative service organization.

The objectives of land reforms policy were set out by the Planners as "the removal of such institutional and motivational impediments to the modernization of agriculture as were innate in the agrarian structure inherited from the past and the reduction of gross inequalities in the agrarian economy and rural society which stemmed from unequal rights in land."

These objectives were translated into the following programmes of action :

- (a) the abolition of the prevalent intermediary system between the state and the tiller of the soil ;
- (b) the conferment of ownership rights on the cultivating tenants in the land held under their possession ;

1. F. A. O., *International Relationship Between Agrarian Reform and Agricultural Development*, 1959, p. 56.

2. F. O. A., *Mediterranean Development Project*, 1959, p. 56.

3. C. Bowles, *The Making of a Just Society*, pp. 40-41.

4. *Ibid.*, pp. 1-3.

- (c) imposition of a ceiling on agricultural land holdings as a measure contributing to the modernization of agriculture and to eliminate parasitic absentee landlordism ;
- (d) rationalisation of the record of rights in land so as to make reflect the rights of tenants, sharecroppers and other categories of insecure landholders ; and
- (e) consolidation of holdings with a view to making easier the application of modern techniques of agriculture.

In the traditional sense land reform is "the redistribution of property rights in land for the benefit of small farmers and agricultural labourers." This is a narrow definition but this is what it has meant in practice, past and present. A broad definition would mean "any improvement in institutions of land tenure or agricultural organisation." The land reform policy should include not only the redistribution of property rights in land but also measures such as the improvement of the conditions of tenancy, agricultural credit, co-operative organisation, agricultural education, marketing and advisory services."¹

According to Prof. Gunnar Myrdal, "land reform is a planned and institutional reorganisation of the relation between man and land and no type of reorganisation of ownership and tenancy of land can be maximally benefitted except when it is combined with certain policy efforts."²

It may be noted that land reform, in its larger context, is a social change affecting the lives of farm people in the developing and under developed countries. The ultimate objective is often the democratisation of the rural social order with a rational distribution of agricultural income and the growth of higher agricultural productivity. The release of unused sources of land labour is also a significant factor to reckon with. Greater social and economic equality is implicit in all land reform policies. Thus a levelling art of the gross disparities in income between rich landowners and the peasants and farm labourers is involved in the idea.

Broadly speaking the agrarian reforms have the following main purposes. viz :—

- (i) to change those aspects of the antiquated land ownership systems that clearly stood in the way of stepping-up farm production ;
- (ii) to do away with exploitation and injustice and provide for the tiller of the soil some security and more equality of status and opportunity ;

1. Zahir Ahmad, "What Land Reform should mean ?" *Economic Times*.
 2. G. Myrdal, *Asia Drama*, Vol. II.

- (iii) to eliminate the defects in the constitutional frame work and evolve a system which would promote rapid growth of the agricultural economy ;
- (iv) to remove such impediments in the way of agricultural production as arise from the character of the agrarian structure ; and
- (v) to create conditions for evolving, as speedily as possible an agrarian economy with high levels of efficiency and production by a better system of land management ;

Thus, land reforms aims at not only redistributing ownership holdings from the viewpoint of social justice but also of reorganising operational holdings from the viewpoint of optimum utilization of land. It also aims at providing security of tenure, fixation of rents and conferment of ownership. *The entire concept of land reform aims at the abolition of intermediaries and bringing the actual cultivator in direct contact with the state so that a congenial atmosphere is created in which the cultivator feels sure of reaping the fruits of his labour.*

Policy on Land Reforms During the Plan Period

The First Five Year Plan gave an authoritative exposition of the national policy on Land Reforms. The Plan divided the tenants-at-will into two classes ; those cultivating land belonging to large landholders and those cultivating land belonging to small and middle owners. It was recommended that all landholders be allowed to resume tenanted land for personal cultivation. Regarding the large landholders it was recommended that "they be allowed to evict their tenants at will and bring under personal cultivation land upto the ceiling limit to be fixed in the State (i. e. three times the family holding). The tenants on non-resumable lands be given occupancy right on payment of a price to be fixed as a multiple of the rental value of land. In the case of tenants of small and medium landowners, only in the event of the land owners failing to resume land for personal cultivation within 5 years while tenants acquire permanent and heritable rights. The tenants of such landowners were granted the safeguard that tenancy should be for a period of 5 to 10 years and then rent should not exceed the level of one-fourth to one-fifth of the gross produce.¹

While formulating the *Second Five Year Plan*, it was recognised that the effort towards reform of tenancy has failed to confer any measure of security on tenants. It was found that large scale ejectment of tenants took place under the guise of 'voluntary surrender of tenancy'. The Second Plan diagnosed "the ignorance on the part of the people of legislative provisions regarding security of tenure, possible lacunae in the law, inadequate land records and administrative arrangement,"² as the main cause for the ejectment of the

1. *First Five Year Plan*, 1951, pp. 190-193.

2. *Second Five Year Plan*, 1956, p. 185.

tenants. It was, therefore, suggested that "voluntary surrendering should become valid only after ratification by prescribed revenue authorities. It was recognised that a uniform definition of personal cultivation, is a must to afford effective protection to the tenants, and therefore personal cultivation was to have three elements, viz., risk of cultivation, personal supervision and labour."¹ The Plan suggested that "existing legislation should be re-examined in terms of the definition of 'personal cultivation' and suitable action should be taken to confer tenancy rights on individuals who have in the past been treated merely as labourers or as 'partners in cultivation'.... A number of crop-sharing arrangements which have all the characteristics of tenancy are not recorded as such and share-croppers are denied rights allowed to the tenants."² Further, the Plan held that "on general ground it is accepted that resumption of land for personal cultivation' should be permitted."³ The Plan tried to reconcile the conflicting interests of landowners who wished to resume land for personal cultivation and of tenants who hoped to acquire permanent rights.

The *Second Plan* reiterated the proposal in the *First Plan* that fair rent should be reduced to the level of 20 to 25 per cent of the gross produce. It suggested that : (i) produce rent should be commuted into cash rent and that preferably the maximum rent should be fixed as a multiple of land revenue ; (ii) tenants of non-resumable areas should be enabled to purchase ownership rights by paying such price fixed at a reasonable level.

After reviewing the steps taken in the different states in the field of tenancy reforms the *Third Five Year Plan* observed, "the impact of tenancy legislation on the welfare of the tenants has been in practice less than was hoped for."⁴ The reasons offered for the failure of the states to enact legislation for regulating the so-called voluntary surrenders and for defining personal cultivation and the free exercise of the right of resumption by land owners. It was suggested that the conditions under which resumption would be allowed should be more stringent. Further, the *Third Plan* reiterated that the final goal should be to confer rights of ownership on as large a body of tenants as possible. It was suggested that the objective providing ownership rights to tenants may be achieved in one of the following three ways :⁵

(1) by declaring tenants as owners and requiring them to pay compensation to owners in suitable instalments, responsible for the recovery of unpaid instalments as arrears of land revenue being accepted by the government ;

1. *Ibid.*, p. 186.
2. *Ibid.*, p. 186.
3. *Ibid.*, p. 187.
4. *Third Five Year Plan*, 1961, pp. 226-27.
5. *Ibid.*, pp. 227-228.

(2) through the acquisition by government of the rights and ownership on payment of compensation and transfer of ownership to tenants, compensation being recovered from them in suitable instalments, and

(3) through the acquisition by the government of the landlords' rights and bringing tenants into a direct relationship with the state, option being given to tenants to continue as such on payment of fair rent to the government or to acquire full ownership on payment of the prescribed compensation.

The Third Plan made a specific recommendation that "steps should be taken to complete the programme for conferring rights of ownership on the tenants on non-resumable land. This could be achieved either by the state acquiring the rights of ownership and transferring such rights to tenants or by declaring tenants as owners and requiring them to make payments in instalments. Better arrangement should be to provide for direct payments by tenants to government rather than to owners, so that an end could be put on the landlord tenant nexus."

Regarding the right of ownership to tenants in respect of land owned by small owners the Plan did not make many recommendations. Though it was considered desirable that tenants of non-resumable land of small holders should also be conferred rights of ownership. It observed, "in view of the large number of petty owners involved, a uniform approach might not be feasible"¹ It, therefore, suggested that "the problem should be studied by states in the light of their conditions with a view to determine the action called for in this connection."²

While formulating the Plan it was realised that, even after years of tenancy reforms, the position of tenants-at-will continued to be extremely precarious. The Plan observed, "It has been seen that under the present arrangement of informal tenancy and share-cropping, the landlord considers it unwise to investing in improving his land ; Likewise the share-cropper or the tenant is either unable or reluctant to investment in inputs like fertilizers.

The insecurity of tenancy has not only impeded the widespread adoption of the high yielding varieties but in some cases led to social and agrarian tensions. In the present context, therefore, it is essential that a cultivating tenant or a share cropper should have effective security of tenure of the land he cultivates and the existing tenancies declared non-resumable and permanent."³

In order to provide security of tenure to tenants and sub-tenants the Plan suggested the following measures :⁴

1. *Ibid.*, p. 228.

2. *Ibid.*, p. 229.

3. *Fourth Five Year Plan*, 1969, p. 177.

4. *Ibid.*, p. 177.

(1) to declare all tenancies non-resumable and permanent. (2) where resumption has been permitted and where applications have already been made, arrangements for quick disposal of such applications; where there is likelihood of large number of evictions as a result of resumption, for further restricting it with a view to reducing the number of cases of resumption : (3) regulation of 'voluntary surrenders' prohibiting land owners from taking possession of land at present tenanted and empowering the government or local authority to settle other tenants thereon ; (4) provision for the complete security of tenure in respect of homestead lands on which cultivators, artisans and agricultural labourers have constructed their dwelling houses; (5) implementation of legislation relating to security of tenure to sub-tenants and ensuring that the provisions of law are not circumvented by the landlords ; and (6) provision for penalty for wrongful evictions.

Regarding the creation of tenancy in future, the Plan recommended that leasing out should be permitted in future only in special cases such as a person suffering from disability or in case a person joins the defence services. In such cases, the tenancy should be for a period of three years at a time subject to renewals unless the disability ceases. In case the person belongs to the defence services, it is recognised that he should be able to take possession of the tenanted land without any delay."¹

Implementation of Land Reforms

Land Reforms have actually been undertaken on the following lines."²

- (a) Abolition of zamindars and other intermediaries (*jagirdars inams*, etc) between the state and the cultivator.
- (b) Tenancy reforms and the reconstruction of the land system (i.e., regulation of fair rents, provision of security of tenure to the tenants and a right to purchase for the tenants).
- (c) Fixation of ceilings on holdings and distribution of surplus land among the landless.
- (d) Reorganisation of agriculture through consolidation of holdings and prevention of their further fragmentation.
- (e) The development of co-operative farming, and co-operative village management.

ABOLITION OF INTERMEDIARIES

The first step in the direction of ensuring proper use of land was to eliminate intermediary tenures like *zamindari*, *jagirs*, *inams*, etc., which existed over 40 per cent of the country at the time of In-

1. *Ibid.*, p. 179.

2. *Report of the Committee on the Panel of Land Reforms*, p. 6

Implementation of Land Reforms

Year of Act	Ceiling on land holding	Surplus land available or declared	Land already distributed	Left to be distributed	Remarks
Andhra Pradesh 1961	27 to 324 acres (for existing holdings) 18 to 216 acres (for future acquisition)	73,692 acres	191 acres (a)	73,501 acres	(a)=represents land taken over from surplus land holders on payment of compensation.
Assam 1956	25 acres (b)	67,934 acres	474 acres	67,460 acres	(b)=A bill introduced to further reduce it to 16.2/3 acres.
Bihar 1961 (c)	10 to 30 acres	n. a.	n. a.	n. a.	(c)=Amended in 1971.
Gujarat 1960	19 to 132 acres	50,000 acres (d)	25,000 acres.	25,000 acres	(d)=expectations are around 2 lakh acres.
Haryana n. a.	30 std. acres	1,76,308 acres	57,019 acres	1,19,289 acres	Tenancy & Agricultural Land Act was in 1955 Punjab security of Land Tenures Act was in 1953.
Jammu & Kashmir n. a.	22-3/4 acres	4,50,000 acres	4,50,000 acres (e)	—	(e)=2,30,000 acres settled with tenants cultivating the land + the remaining area allotted to displaced persons. Tenancy Act was in 1923.
Kerala 1969 (f)	12 to 15 acres	1,50,000 acres	n. a.	n. a.	(f)=relates to the year of amendment, while the Land Reforms Act relates to 1963.
Madhya Pradesh 1960	10 to 54 acres	84,000 acres	13,000 acres	71,000 acres	—
Maharashtra 1961	18 to 126 acres (existing holdings) 12 to 84 acres (future acquisition)	2,71,000 acres	1,23,000 acres	1,48,000 acres	—

	27 to 216 acres (existing holdings) 18 to 144 acres (future acquisition)	1,12,000 acres	n. a.	n. a.	(g) = relates to the year of enforcement of the ceiling provisions ; Land Reform Act, was enacted in 1962.
Mysore 1969 (g)					
Orissa 1960	25 to 100 acres 20 to 80 acres (amended)	1,75,000 acres	—	Provisions not yet enforced—	
Amended : 1965 Punjab n. a.	30 std. acres	71,200 hectares	25 000 hectares	46,000 hectares	Tenancy & Agricultural Land Act was in 1955, Punjab Security of Land Tenures Act was in 1953.
Rajasthan 1960	22 to 336 acres	—No land has so far been declared surplus or acquired—			
Tamil Nadu 1961	24 to 120 acres 12 to 60 acres (amended)	25,750 acres	17,209 acres	8,541 acres	—
Amended : 1970 Uttar Pradesh 1960	40 to 80 acres	94,000 hectares	25,000 hectares	42,000 hectares	—
West Bengal 1953	12.4 acres in irrigated areas 17.3 acres in other areas	n. a.	n. a.	n. a.	—
Himachal Pradesh 1953	30 acres Dist. Chamba 60 to 80 acres in Pepsu area	—Provisions so far not enforced—			
Manipur n. a.	25 acres	—Provisions so far not enforced—			
Tripura n. a.	25 std. acres	n. a.	n. a.	n. a.	n. a.

dependence. The progress for the abolition of intermediaries has been completed. These measures have brought more than 2 crore of tenants and subinfeudatories into direct relationship with state and became owners of land. Over 1.6 crore hectares of cultivable waste lands and private forests had been distributed in different states to landless agriculturists.

Land revenue collections in Bihar, Orissa, Tamil Nadu, U. P., M. P. and W. Bengal being Rs. 124 crores while land revenue in all States together increased from Rs. 78 crores in 1965-66 to Rs. 120 crores in 1966-67, to Rs. 124 crores in 1973-74 and to Rs. 199.3 crores in 1976-77. The total agricultural income increased from Rs. 5,200 cr. in 1952-53 to Rs. 6,080 cr. in 1958-59, Rs. 9,080 cr. in 1965-66, to 19,033 crores in 1972-73 and to Rs. 28,140 crores in 1976-77.

About 6 million tenants or share-croppers have acquired ownership of more than 7 million acre.

As a sequel to legislation prescribing ceilings on land holdings, over 10 lakh hectares of land have been declared as surplus, about half (5.1 lakh hectares) of which has been actually taken over by the State, a little over 3.5 lakh hectares have so far been distributed among 6.1 lakh allottees. The work of implementation is still in progress.

The basic rate of compensation varied from states to state. Compensation was fixed at a multiple of net income of the proprietor, at the time of expropriation as in Andhra Pradesh, Tamil Nadu, Karnataka, West Bengal, Delhi, Bihar, Orissa, Rajasthan, Manipur and Tripura.¹ This multiple was high in the case of lower income brackets and smaller in upper income brackets. In some states, a uniform multiple of net income was introduced as compensation, but proprietors with small income were paid rehabilitation grants in addition. In some states, compensation was a multiple of the revenue assessment, as in Assam, Gujarat, M. P., Maharashtra, U. P. and Himachal Pradesh. In yet some other states, compensation was related to the market value of land, as in Kerala.

The compensation was to be paid in cash or in bonds. A large number of states like Andhra Pradesh, Assam, M. P., Orissa, Tamil Nadu and West Bengal followed the principle of cash payment in compensation. But Rajasthan, U. P., Bihar, Gujarat, and Maharashtra adopted the principle of payment in cash as well as in bonds. The big proprietors were to be given bonds but the smaller ones

¹ This multiple is 8 in Uttar Pradesh, 7 in Rajasthan and 10 in Madhya Pradesh (other than merged territories). In Madhya Bharat, it is 8 for the zamindari areas and 7 for the Jagirs. In other States, compensation has been fixed on a sliding scale, the multiple varying as under :

Assam 2 to 15 ; Bihar 3 to 20 ; M. P. 2 to 10. Madras 1 1/2 to 30 ; Orissa 3 to 15 ; U. P. 8 to 28 and Bengal 3 to 20.

were to be paid in cash. The bonds were to be redeemed in equal instalments spread over a period varying from 20 to 40 years. The ex-intermediaries have been given compensation amounting to Rs. 670 crores in cash and Bonds.¹

Economic and Social Effect of Abolition of Intermediaries

The economic and social effects of abolition may be stated as follows :—

1. *Heavy Burden of Compensation.* Intermediaries have been abolished in nearly all the states and this has created the possibility of transferring a large part of the rent to the state. But the compensation to be paid to the landlord has been very big amount compared to which the additional revenue that accrues to the states is 'pitifully low' (being only Rs. 29.52 crores, against a total compensation of Rs. 670 crores, i.e., only 3.5 per cent of the compensation) This means that the old feudal burden on the community has been very heavy.

Besides, the question of revenues, rents and compensation, there are other social consequences of the change. Daniel Thorner has summarised them thus : "First of all the new laws took away from intermediaries their right to collect rents as lands which they did not themselves 'cultivate'. The same laws relieved the intermediaries of the responsibility for paying land revenues on such lands..... In U.P. the vast majority of intermediaries were transferred by the Act into a class of specially privileged agriculturists."²

2. *Increase in the Number of Feudal Landlords.* The Acts abolishing *zamindaris* and *jagirdaris* have not divested the feudal landlords of their large areas of agricultural land provided it was let out to tenants but cultivated by employing hired labour in any form. The state has acquired only the rent-receiving interests. In consequence, the rent-receiving zamindars have been converted into landholders, with superior rights in land, employing agricultural workers or share-croppers and have swelled the ranks of 'owner cultivators' without being tillers of the soil. The sub-tenants, tenants-at-will and crop-sharers do not still have the security of tenure and the rest because most of the state legislations have failed to take note of this fact. "A close study of these disparities reveals a rather significant and pointed conclusion, namely, that the smaller tenant has received much less protection and has suffered more than the bigger one."³

"The feudal landlords are permitted or rather encouraged to shift their position from rent-receivers to self-cultivators, the tenants of a certain category are entitled to acquire ownership on payment

1. *India*, 1977-78, p. 216.

2. Thorner, D., *Op. Cit.*, pp. 18-22.

3. A. M. Khushro, *Economic and Social Effects of Jagirdari Abolition and Land Reforms in Hyderabad*, p. 43.

of a purchase-price the intermediaries can legally resume land from the tenant for self-cultivation and can even illegally evict the tenants in order to extend self-cultivated areas. As the combined result of these processes, owner cultivation has increased and tenant cultivation has decreased. In this pattern, the old zamindars, jagirdars and other intermediaries have retained a significant position as owner cultivators.¹

Prof. Baljit Singh's survey of U. P. has also revealed that in this respect the old zamindars have benefited even more than the actual tillers. He has stated that 57.7 per cent of the bhoomidhars in U. P. are the old zamindars who have been converted into bhoomidhars under the provisions of the Zamindari Abolition and Land Reforms Act of U. P.²

3. *Large Scale Eviction.* The statutory measures for the abolition of intermediaries permit the latter to resume land for self-cultivation. In certain states (as in Assam, Punjab, A.P.) this right of resumption is subject to an upper limit upto which a landowner is permitted to resume. In certain other States resumption is permitted provided a specified maximum area is left to the tenant (as in Maharashtra, Rajasthan, H.P. and the Punjab). The limitations and the restrictions put to the landowner's right of resumption has failed to offer the tenants any effective protection from eviction. This is evident from the magnitude of evictions in Maharashtra and A.P. It is a general phenomenon throughout India. Whereas in vast majority of the cases no recourse to law was had and the tenants surrendered their land because the landlord wanted it back.³ Thus the right of resumption granted to the landowners not merely deprived many tillers of the benefits of land reform but they have also become victims of evictions.

Feudalism has been curbed but not eliminated. Even absentee landlordism has not disappeared. According to the N. S. S. (8th Round), about 31 m. acres of land is under absentee land owners, i.e., land leased by rural household from non-rural households. It represents 50 per cent of all land leased. The central question of land reform is, therefore, one of taking surplus land of the big landlords and of giving the same to the actual tillers.

Daniel Thorner's observations are very important on this point. In his opinion, the following are the 'central elements' in India's agrarian problem.⁴ :—

- (1) A peculiarly complex property structure topped by state claiming what amounts to a proprietary right to 'rent'.

1. *Ibid.*, p. 75.

2. B. Singh, *Next Step in Village India*, 1962.

3. G. L. Nanda, *Progress of Land Reforms in India*, p. 9.

4. D. Thorner, *Op. Cit.*, p. 76.

- (2) The survival, despite land reforms and abolition of intermediaries, of a class of non-cultivating proprietary right-holders who continue to take substantial rents from the working peasantry-tenants, tenants-at-will or crop-sharers, where these proprietors cultivate by hiring labourers, they pay low wages.
- (3) The consequent persistence, after land reforms, of a considerable gap between proprietary right-holding and the physical cultivation of land.

REGULATION OF RENT

The principal tenancy reform measures concern 3 F's to the tenants, (i.e., *Fixity of tenure*, *Fair rent* and *Free transferability*), the regulation of rents, providing security of tenure, and enabling more tenants to become owners. These measures ensure the protection to the tenants from eviction, a minimum period of tenure and fixity of tenure.

The progress made in these directions is outlined below :—

Prior to the *First Five Year Plan* the customary level of rents commonly paid by tenants-at-will, non-occupancy tenants and share-croppers over the greater part of the country was one-half of the produce or more. In addition to rent, very frequently there were other payments which enhanced the burdens borne by tenants. The situation was reviewed at length in the *First Five Year Plan* which suggested a rate of rent not exceeding one fourth or one-fifth of the produce. Over the past few years, all states have enacted legislation for regulating rents accordingly, viz., in Gujarat, Maharashtra the maximum rent now stands at one-sixth of the produce or 3 to 5 times the land revenue, whichever is less. In Assam, Manipur and Tripura maximum rents vary between $1/4$ to $1/5$ of the gross produce. In Orissa and Bihar $1/4$ of gross produce has been fixed as rent. In Kerala maximum rent varies between $1/4$ to $1/2$. In Punjab, $1/2$ per cent. In Rajasthan, fair rent is fixed at $1/6$ th of the gross produce but in case of cash rents, at twice the land revenue assessment.

“In *Andhra Pradesh*, in Andhra area, the rent is not to exceed 30 per cent of the gross produce for irrigated lands and 25 per cent of produce as dry lands. In the *Telangana* the rent is not to exceed one-fourth of the gross produce for irrigated lands, one-fifth in other cases or 3 to 5 times the land revenue according to the class of soil, whichever is less. In *J. and K.*, a landlord whose holding exceeds $12\frac{1}{2}$ acres is entitled to receive as rent one-fourth of the produce for wet land and one-third of the produce for dry land. Smaller land-holders can receive upto half the produce as rent. In *Kerala*, for paddy lands the rent is normally one-fourth of the gross produce. In *M. P.* the rent is not to exceed 2 to 4 times the land revenue; in *Tamil Nadu* it is not to exceed 40 per cent of the produce for irrigated land 35 per cent where irrigation is supplemented by

lift irrigation and, 33.33 per cent in other cases. In *Panjab and Haryana*, it is not to exceed one-third of the gross produce. In *U. P.* the crop share is not to exceed 50 per cent of the produce if the landlord contributes the cost of cultivation, and 40 per cent if he does not. "In *Delhi and Himachal Pradesh*, the rent is not to exceed $1/5$ of the gross produce or four times the land revenue."

"In *Gujarat*, the rent has been fixed at one-sixth of the gross produce or 2 to 5 times of land revenue assessment or one-sixth of the gross produce, whichever is less. In *Bihar* it is one-fourth. In *Maharashtra* it is not to exceed 2 to 5 times the assessment or one-sixth of the produce, whichever is less. In *Karnataka*, rent varies from $1/4$ to $1/5$ of the gross produce, depending on the class of land. In *Orissa* rent is not to exceed one-fourth. In *West Bengal* crop-share is not to exceed 50 per cent of the produce if the landlord contributes the cost of cultivation and 40 per cent if he does not."¹

It may be noted that owing to the weak position of the tenants and the prevalence of widespread land hunger, the law regulating rents is observed more in its breach than in its compliance. The *Third Five Year Plan* asserted. When there is a pressure on land and the social and economic position of tenants in the village is weak, it becomes difficult for them to seek the protection of law. Moreover, resort to legal processes is costly and generally beyond the means of tenants. Thus, in many ways, despite the legislation, the scales are weighed in favour of the continuance of existing terms and conditions."² For example, in a village situated only about 32 kms from Bangalore it has been found that the share-croppers were invariably given one-half of the produce to the land owners though under the law the maximum rates of interest were 20 to 25 per cent of the gross produce.

These facts show that the provisions regarding fair rent have remained largely un-implemented in most parts of the country as far as share-cropping tenant is concerned.

SECURITY OF TENURE

The security of tenure is correctly brought out by the remark of Sir Arthur Young, who observed, "Give a man the secure possession of a bleak rock and he will turn it into a garden : give him a nine years' lease of a garden he converts it into a desert." Therefore, unless the cultivator takes a personal interest in the land, much improvement in production cannot be expected. That is why he needs to be given security in the tenancy rights. The first Three Plans emphasised that "tenants should be accorded permanent rights in the lands leased in by them subject to a limited right of resumption to be granted to land owners." In accordance with this, legislation

1. *India*, 1970, pp. 258-261.

2. *Third Five Year Plan*, p. 223.

providing for security of tenure has been enacted in all States and Union Territories. This legislation has three essential aims : *firstly*, that ejectments do not take place except in accordance with the provision of the law ; *secondly*, that land may be resumed by an owner, if at all, for 'personal cultivation' only ; and *thirdly*, that in the event of resumption the tenant is assured of prescribed minimum area.

The *Fourth Five Year Plan* stated that the "rents as fixed by law are still high in Andhra area, J. and K., Tamil Nadu, Punjab, and West Bengal and these should be brought down to the level recommended in the Plans to $1/4$ or $1/5$ of the gross produce. Beside produce rents which are difficult to enforce should be abolished and replaced by fixed cash rents so that the uncertainties arising out of annual fluctuations in rents may be eliminated and the tiller assured of the full benefits of his investment."

The measures adopted in different States, where comprehensive legislation has been enacted, follow broadly the following three patterns :

(i) In Uttar Pradesh and Delhi, all tenants in cultivating possession of land have been given full security of tenure (permanent and heritable rights) without land owners having any right to resume land for personal cultivation.

(ii) In Assam, Maharashtra, Gujarat, Punjab, Rajasthan and Himachal Pradesh, Kerala, Orissa, M. P. and Karnataka, land-owners are permitted to resume a limited area for personal cultivation, subject to the condition that a minimum area or a portion of the holding is left with the tenants.

In Maharashtra an owner may resume for personal cultivation from the tenants land not exceeding three economic holdings (*i. e.*, 12 to 48 acres). Every tenant is entitled to retain half the area leased to him. In Punjab the limit of resumption is 30 standard acres : each tenant is entitled to retain up to 5 standard acres until alternative land is provided by the State Government. In Rajasthan, the land owners are permitted to resume land held by tenants in excess of a minimum holding with a net annual income of Rs. 1,200. It varies from 15.6 acres in Ganganagar area to 12.5 acres in Jaisalmer. The excess land held by a tenant can be resumed by the landlord. In Himachal Pradesh, the limit of resumption is fixed at 5 acres and each tenant is entitled to retain three-fourths of his tenancy land. In Assam the landlord can resume land up to a maximum of $33 \frac{1}{3}$ acres provided that a tenant is left with a minimum area of $3 \frac{1}{3}$ acres, until he is allotted alternative land of equivalent value in the locality.

(iii) In West Bengal, Jammu and Kashmir, Manipur, and Tripura a limit has been placed on the extent of land which a land owner may

resume, but the tenant is not entitled to retain a minimum area or a portion of his holding in all cases.

In West Bengal a landowner who owns less than $7\frac{1}{2}$ acres is permitted to resume the entire area from a *bergadar* (crop-sharer). Bigger landowner can resume two-thirds of the area. In the case of tenants (other than crop-sharers) no right of resumption is allowed. The tenants have been made raiyats holding directly from the state. In the former State of Hyderabad the landowner is entitled to resume land up to 3 family holdings (12 to 180 acres) subject generally to the condition that the tenant is left with a basic holding ($1\frac{1}{3}$ acres to 20 acres) or half his tenancy land. Small owners, however, resume the entire area.

In Kerala, the limit of resumption is 5 acres of double crop paddy land or its equivalent. A person owning more than this limit is not entitled to resume any land. Small owners are permitted to resume half the area. Resumption is not allowed in the Cochin and Malabar areas where most tenants have already acquired full security of tenure under previous laws.

Special provisions have been made in respect of small holders in Bihar, J. & K, Karnataka, the Vidarbha and Marathwada areas of Andhra Pradesh, as would be clear from the table given below :

Definition of a Small Farmer

State	Holding
1. Bihar	Not more than 5 acres of irrigated land or 10 acres of other land.
2. Vidarbha	holding between 7 to 40 acres of land
3. Marathwada	holding between 2 to 24 acres
4. J & K	3 acres if his monthly income does not exceed Rs. 300
5. Andhra Pradesh	between 1.3 to 20 acres.
6. Karnataka	Less than 4 standard acres.

The present position is like this :

- The laws provide for a minimum area being left with tenants as absolutely non-resumable.
- The laws in Karnataka and U. P. do not now permit any resumption even for personal cultivation.
- The right of resumption for personal cultivation in most states was limited for a given period, which has now expired.
- The laws of Andhra Pradesh, Assam, Haryana, Punjab and West Bengal, the right to resumption is a continuing one.

Legislation provides for bringing tenants of non-resumable lands into direct relationship with the state in the following three ways :

(i) By declaring tenants as owners and requiring them to pay compensation to owners in suitable instalments, responsibility for recovering unpaid instalments as arrears of land revenue being accepted by the state government. This method was adopted by Gujarat, Maharashtra, Madhya Pradesh and Rajasthan.

(ii) Through the acquisition of rights of ownership by the state government on payment of compensation and transfer of ownership to tenants, compensation being recovered from them in suitable instalments. This course has been followed in Delhi and in respect of under-raiyats (other than Bargadars), without payment of compensation in West Bengal.

(ii) Through the acquisition by the state government of the landlords' rights and bringing tenants into a direct relationship with the State, option being given to tenants to continue as such on payment of fair rent to the government or to acquire full ownership on payment of the prescribed minimum. This has been done in Kerala and Uttar Pradesh.

Considerable progress has been achieved in regard to the conversion of tenants and sub-tenants of non-resumable lands into owners. Noteworthy progress has been made in U. P. benefiting 1,500,000 tenants with 810,000 hectares, Gujarat benefiting 462,000 tenants with 970,000 hectares and Maharashtra benefiting 800,000 tenants with 613,000 hectares of non-resumable land. The corresponding figures for Rajasthan are 199,000 and 382,000, respectively, for Delhi 29,000 and 16,000 respectively, and for Punjab 22,000 and 60,000 respectively. About 3.7 million tenants and sharecroppers have acquired ownership rights on non-resumable lands. The area involved amounted to about 3.67 million hectares.¹

In spite of these measures, tenants' households constitute only 23.56% of total cultivating households. The proportion is higher in certain states such as Pondichery (45 per cent), Haryana and Punjab (39 per cent); Bihar (37 per cent), Tripura (36 per cent), Kerala (31 per cent), H. P. (27 per cent) and Karnataka as well as J. & K. (25 per cent).²

The measures relating to security of tenure restrict the ground on which a tenant shall be liable to ejectment. These grounds are :

- (i) non-payment of rent ;
- (ii) performance of an act which is destructive or permanently injurious to the land ;
- (iii) sub-letting the land ;

1. *Fourth Five Year Plan*, p. 176.

2. *Ibid.*, p. 176.

- (iv) using the land for purposes other than agriculture ; and
- (v) resumption of land for personal cultivation by the landlord.¹

Ejectment is to take place through the order of the Revenue Court and in the case of first four conditions, the land owner, after getting his tenant ejectment, can put another tenant in his place. In the case of the last condition the landlord after ejecting his tenant has to cultivate his land personally.

In Andhra, Tamil Nadu, Karnataka and Orissa, apart from the conditions stated above, the tenants are liable to ejectment from their entire area after the expiry of minimum period of lease prescribed under the law. The period of interim protection is extended from year to year and in some cases, for every 6 months. This creates uncertainty in the minds of the tenants. In Bihar, even interim protection has not been given to tenants.

The provisions relating to right of resumption also carries from state to state. While in states like U. P. and Delhi where no resumption was allowed for personal cultivation, there are States like Jammu and Kashmir, Andhra Pradesh, Tamil Nadu and West Bengal wherein certain legislation permits ejectments of tenants or crop-sharers from the entire area if the landlord wants to exercise the right of resumption.

Many a landowner circumvented the tenancy laws and regained possession of tenanted land by persuading 'his tenants to give up tenancy rights voluntarily'.

The persuasion was often accompanied by threats and even use of brute force. The Third Plan, therefore, laid down that "(1) Voluntary surrenders should not be regarded as valid unless they were duly registered with the revenue authorities; (2) even where the surrender was held to be valid, the land owner should be entitled to take possession of land only up to his right of resumption permitted by law.

But these suggestions did not prove successful and the Fourth Plan suggested that "no land owner should be allowed to regain

1. 'Personal cultivation' has been defined to include :—

- (1) Personal supervision by the owner himself or by a member of the owner's family and in order that personal supervision may be effective, the owner or a member of his family must reside in the village in which the land is situated or in nearby village within a distance to be prescribed ;
- (2) the owner must bear the entire risk of cultivation ; and
- (3) the owner or a member of the family should contribute personal labour to cultivate the land.

If an owner fails to cultivate the land personally in the manner prescribed above, the land should revert to the tenant.

possession of surrendered land that the Government should have the power to allot such land to eligible persons." The suggestion of the Fourth Plan was not fully implemented by the states till August 1975. "No provision for regulating surrenders has been made in Haryana, Punjab, Tamil Nadu and U. P. Provision has been made for the scrutiny of surrenders by the revenue authorities in A. P., Bihar, Assam, Gujarat, J & K, Karnataka, Kerala, M.P., Maharashtra, Manipur, Orissa and Tripura. However, suggestion that all surrenders should be in favour of the Government, has only been acted upon in Gujarat, H.P., Kerala, Orissa, Karnataka and West Bengal."

Thus, in several states, the provisions made for regulation of surrenders are inadequate and ineffective.

RIGHTS OF OWNERSHIP

Security of tenure and reduction of rents are the first stage in tenancy reform. The ultimate goal is to confer rights of ownership on as large a body of tenants as possible.

More than a dozen states have enacted laws conferring ownership rights on the cultivating tenants. Notable among them are Maharashtra, Gujarat, Kerala, Karnataka, Assam, H. P., J and K, Rajasthan, M. P., and Orissa. In three or four other states (like Andhra Pradesh, Haryana, Punjab) the tenants have been given the optional right to purchase the land held under their cultivation by paying to the landlord a premium fixed by the appropriate authority according to the terms of the law. Everywhere the premium is so fixed as not to be beyond the paying capacity of the tenant. Steps are being taken for persuading all the remaining states to enact laws automatically conferring ownership rights on the cultivating tenants.

In U.P., all tenants and sub-tenants have been brought into direct relationship with the state.

Evaluation of Tenancy Reforms

Dr. Desai undertook a study in the implementation of tenancy abolition law in the former Bombay area of Gujarat. It revealed that "out of the 10,45,305 tenancy cases that existed on April 1, 1957, only 890,758 cases had been disposed of by April 1, 1964. In 314,838 cases, the existence of tenancy was denied. The latest information shows that there were in all 12.97 lakh tenants and ownership rights were purchased by 7.73 lakh tenants."

After considering all the aspects of the matter Dr. Desai reached this conclusion : "The results of tenancy abolition, however, were not as expected. About half the year previously (under passed) tenancy into the ownership of their respective tenants. About 12 per cent of the land held by 9 per cent of the tenants continued under recognised tenancy. A little over 2 per cent of the lands of

tenants slipped from them in default of payment of compensation amounts. The rest were the cases in which the tenants either denied tenancy, surrendered their lands to the land owners or kept away from the hearings of the tribunals and, therefore, missed of their own volition to be owners of land they cultivated on lease. Thus a sizeable tenantry escaped ownership under tenancy abolition."¹

Tenancy legislation has been rendered ineffective because of the following reasons :

(i) *The legislation has not gone far and has fallen short of fulfilling the objects laid down by the Planning Commission.* For example, the fixation of statutory rent as high as customary rent (e.g., at one-half of the produce) may be of limited value to tenants and it may be natural to expect that tenants in these States would not be paying less than the statutory rent.

(ii) *Legislation has generally been pursued in an unsystematic and unco-ordinate manner and has been suffering from many technical defects and contradictions.* For example, in Saurashtra the legislation was passed for prohibiting leasing in future except by persons suffering from a disability ; and it was provided that leases made in contravention of the law shall be declared null and void and both the lessee and the lessor shall be liable to fine. This resulted in evasion of the provision through collusion between the lessor and the lessee. In some states like M.P. and Rajasthan where legislation was enacted to give interim protection, no provision was made to fix maximum rents. Again, rents were fixed or tenants were given a right to purchase ownership without giving a right of adequate protection to tenants against ejectment. Security of tenure with fixation of maximum rents is useless inasmuch as the landlord can enhance the rent to any extent and get the tenant ejected on non-payment of the rent so enhanced. Further, in many states like Rajasthan, Punjab and Madhya Pradesh, no legal sanctions were provided against the landlord if a tenant was ejected unlawfully or the landlord realized more than statutory rent. Sometimes, while provision was made for penalty against unlawful ejectment the law did not provide for the restoration of the ejected tenant.

(iii) The term '*personal cultivation*' has been defined in a loose way. Because of this defective definition, the lands, ostensibly resumed by the landlords on grounds of '*personal cultivation*' are cultivated through crop-sharing arrangements wherein crop-sharers are treated as labourers or as partners in cultivation. Statutory protection afforded to the cultivating tenants has in many cases proved illusory.

(iv) The Third Plan and the Nanda Committee Report drew attention to the administrative difficulties in the enforcement of land reform measures. The land reforms have been enacted very slowly

1. Desai, M. B., *The Tenancy Abolition and Emerging Pattern in Gujrat*, pp. 66 ; 123.

and without arrangements to their administration and speedy implementation. The non-maintenance of correct and upto-date land records has been a great lacuna, in as much as they do not provide information in respect of holdings of the tenants and crop-sharers.

As a matter of fact, absentee-land-ownership and the widespread incidence of share-cropping characterised by insecurity of the tenure and extortionate rents continue to be the two main formidable obstacles to the modernization of agriculture in some parts of the country, particularly in Eastern Zone.

It needs hardly be emphasised that "the tenure system which secures the cultivator fair rewards for his efforts will promote the individual virtues of self-help, self-reliance, thrift and independence and at the same time the social virtues of tolerance, public spiritedness, co-operation and mutual working for the common good."¹

CEILING ON LAND HOLDING

Land reforms in India had envisaged that beyond a certain specified limit, all lands belonging to the landlords will be taken over by the state and allotted to small proprietors to make their holdings economic or to landless labourers to meet their demand for land hunger. "Among all resources, the supply of land is the most limited, and the claimants for its possession are extremely numerous. It is, therefore, obviously unjust to allow the exploitation of any large surface of land by a single individual unless other overwhelming reasons make this highly desirable. Further, in the light of the available supplies of land, labour and capital, it would be undesirable to encourage capital intensive method of production. Moreover, whatever the economies of large-scale management, they should, in the congested state of our countryside, accrue to collective or co-operative bodies of cultivators rather than an individual family. Lastly, in the context of current socio-political climate redistribution of land would rather appear to be impressive."²

About 94.42 per cent of the household operational holdings are below 20 acres and 91.11 per cent are below 15 acres. The average operational holdings is in five fragments. The Nagpur Resolution of the Congress Party on Land Reforms, therefore, declared that the States must enact legislation relating to ceiling on land holdings and that surplus land should vest in the panchayat and should be managed through co-operatives consisting of landless labourers. The ceiling on agricultural holdings was intended to : (i) meet the longer hunger of the landless ; (ii) reduce the glaring inequalities in land ownership so that the way to the development of co-operative rural economy could be proved (iii) enlarge self-employment in owned land as distinguished from sub-letting and tenant cultivation.

1. E. I. Jacoby, *Inter-Relationship between Agrarian Reforms and Agricultural Development*, p. 6.

2. *Report of the Committee of the Panel on Land Reforms*, p. 99.

The imposition of ceiling has two aspects, viz., (a) fixation of upper limit for future acquisition in order to prevent accumulation of large areas of land in few hands in future ; and (b) fixation of an upper limit on present landholdings in order to secure equitable distribution of land.

The land ceiling measures were initiated in many parts of the country in the late 50's and early 60's. However, except for Jammu and Kashmir and West Bengal, the result was disappointing almost everywhere. By the turn of the last decade, about 26 lakh acres of land was declared surplus ; but only a half of it could really be taken over and again, only a half of that could actually be distributed by the state among the landless agricultural workers and other categories of the rural population. In Bihar, Karnataka, Orissa and Rajasthan, no land was declared surplus on the imposition of ceiling legislation. Obviously, the partitioning of land or *benami* transfer had taken place before the imposition of ceiling. Further, different states were following different definitions. For example, Assam, Bihar, Haryana, J and K, M.P., Orissa, Punjab, U.P. and West Bengal used the "individual landholder" as the basis of ceiling, but in other states, the level of ceiling was fixed with reference to the "family", comprising of wife, husband and minor children.

Therefore, renewed efforts were made at implementing land ceiling measures from the late sixties. These led to the laying down of a new national policy on land ceiling which was evolved on the recommendations of the Chief Ministers' conference held in July 1972.

The following guidelines were approved for implementation :

- (i) Taking into account the fertility of the soil and other conditions, the best category of land in a state with assured irrigation and capable of yielding at least two crops a year, the ceiling should be fixed between 10 to 18 acres.
- (ii) In the case of land having assured irrigation for only one crop a year, the ceiling shall not exceed 27 acres.
- (iii) In case of owners with holdings consisting of different types of land holdings after converting the better categories of land into lowest categories should not exceed 54 acres.
- (iv) The unit of application should be a family of five members ; where the number of members in the family exceeds 5, additional land may be allowed for each member in excess of five in such a manner that the total area admissible to the family does not exceed twice the ceiling limit for family of 5 members. Where both husband and wife hold lands in their own names, the two will have rights in the properties within the ceiling in proportion to the value of land held by each before the application of ceiling. Each

major child is to be treated as a separate unit for the purpose of application of ceiling.

- (v) Exemptions were permitted in these cases :
 - (a) exemptions in favour of plantations of tea, coffee, rubber, cardamom and cocoa ;
 - (b) lands held by industrial or commercial undertakings for non-agricultural purposes should be exempted from the ceiling law ; and
 - (c) sugarcane factories may be permitted to retain an area not exceeding 100 acres.

The main features of this policy were :

- (i) a considerable lowered ceiling for a family of five ;
- (ii) very few exemptions from the ceiling ;
- (iii) the provision for payment of compensation to the farmer land owners at rates considerably lower than the market rates so that the allottees of surplus land could pay them over a period of years without any difficulty ;
- (iv) the retrospective applications of the laws so that various transactions in land made by land owners with a view to evading or avoiding the effects of the impending ceiling could be set at naught and a clear announcement that most of the surplus land would be distributed to landless workers.

By now all the states in the country have enacted laws fully reflecting this policy. Only Nagaland and Meghalaya do not have any land ceiling laws as there is common ownership of land in these states. In order to insulate the current ceiling measures from challenge in the courts of law, provision has been made for barring the jurisdiction of civil courts in regard to disputes that may arise from the implementation of these laws. These laws have been included now in the Ninth Schedule to the Constitution so that they are beyond any challenge in the courts.

By now, of about 14 lakh cases, over 12 lakhs concerning distribution of land, have been scrutinised and disposed of. This has led to the declaration of about 16.5 lakh hectares of land as surplus, of which over 8.9 lakh hectares have been taken possession of by the states and about 5.5 lakh hectares have been distributed among about 9.3 lakh beneficiaries.

CONSOLIDATION OF HOLDINGS

Since land holdings in India are, by and large, too fragmented and small to lend themselves to efficient cultivation, consolidation of holdings has, therefore, been accorded high priority. Necessary legislative measures have been enacted in all the states except for Andhra area of Andhra Pradesh, Arunachal Pradesh, Mizoram,

Manipur, Meghalaya, Nagaland, Tripura, Tamil Nadu and Kerala. Consolidation has been done either voluntarily as in Gujarat, M.P. and West Bengal or compulsorily. Progress in consolidation of holdings in the different states has been quite uneven. The work is practically complete in Punjab, Haryana and Western U.P. In the remaining states the work is yet to gather necessary momentum. More than 44 million hectares of land has already been consolidated.

RECORD OF RIGHTS

For the implementation of land reforms, up-to-date land records reflecting the rights of the actual tiller of the soil are absolutely necessary. Hence, efforts are being made for updating the record of rights and for ensuring that besides recording ownership, the rights of tenants, share croppers and other insecure holders are also reflected in it. The state of the record has particularly been bad in the former permanent settlement areas and some of the southern states. Tenancy, share-cropping and similar other arrangements are mostly entered into by word of mouth. This has resulted in a great deal of insecurity of tenants, etc. Therefore, legislative measures have been undertaken in most of the states for providing a statutory basis for recording the rights of tenants, share croppers, etc. either during the resurvey and resettlement of operations or otherwise through *ad hoc* measures.

CO-OPERATIVE LAND MANAGEMENT

The ultimate solution of the land problem, as envisaged in the First Plan is the "co-operative land management"

The co-operative village management assumes that the ownership of land belongs to the peasants. The essentials of this type of managements are :¹

- (i) All the village land is treated as one single farm.
- (ii) Cultivation of the entire village is organised to secure the maximum advantage of the village community.
- (iii) Village resources are well organised and maximum employment is provided to owners of land. Workers, who are non-owners of land receive remuneration for their work, while owners receive an additional return for their rights of ownership of land.
- (iv) The village management body allots the constituted blocks for cultivation purposes.
- (v) This system is usually adopted when at least $\frac{2}{3}$ of the owners of land are permanent tenants holding not less than $\frac{1}{2}$ of the cultivated area of the village.

According to the Planning Commission, during the transition of co-operative village management, lands in the village will be

1. *First Five Year Plan*, pp. 102-103.

managed in three ways :¹ *Firstly*, there will be the individual farmers cultivating their own holdings. *Secondly*, there will be groups of farmers who pool their lands voluntarily in their own interest into co-operative working units. *Thirdly*, there will be some land belonging to the village community as a whole, consisting of common lands, the village site, the cultural wasteland assigned to the village, and lands available for settlement of landless. The aim would be to enlarge the co-operative sector until the management of the entire land in the village becomes the responsibility of the community.

The main agencies for achieving co-operative village management are :—

- (i) The National Extension Service and programme for increasing agricultural production and developing other allied activities ;
- (ii) the village panchayats ;
- (iii) step taken to develop co-operative credit, marketing, warehousing, processing, etc. ;
- (iv) programmes for the development of village industries ;
- (v) programmes for assisting voluntary cooperative farming societies.

REVIEW OF THE LAND REFORMS POLICY

Though land reforms have been instrumental in bringing about some change yet they have brought little justice to the rural people. In this connection, the observation of Prof. Dantwala may be noted with interest : “By and large land reforms in India enacted so far and those contemplated in the near future..... are in the right direction ; and yet due to lack of implementation the actual results are far from satisfactory.”²

Land reforms programme has moved very slowly, with the result that the vested interests in land could find out ways to pass legislation. *Mahalanobis Committee* reached this conclusion : “In general, our finding is that both ownership and operational holdings are very highly concentrated. Also, there was no appreciable reduction in equality between 1953-54 and 1959-60, inspite of the fact that a good deal of land reform measures had been enacted during the period, 1963-64, the top of households owned 17 per cent, the top 5 per cent owned 41 per cent, and the top 10 per cent owned 58 per cent of ownership holdings in the households ; in 1959-60 these proportions were 16.40 and 56 per cent respectively. The bottom 20 per cent of the households did not own any land in either of these two

1. *Second Five Year Plan*, p. 206.

2. Report of the Tokyo Seminar on *Problems of Economic Growth*, Congress for Cultural Freedom, p. 2.

years.”¹ Naturally, this means that land reforms have touched only a fringe of the problem of land redistribution.

Land reforms have failed to prevent the sub-letting and rack-renting. This is corroborated by the findings of Dr. Singh, who says, “Not only have the recent land reforms not touched the issue of land distribution but they have also failed in preventing sub-letting and renting. Quite many of those who till the soil have no land rights whereas many of those who do not cultivate still own and possess land.”²

There has been no uniformity followed in the execution of the land reforms policy and legislation, e.g., the share of rent to be charged from the cultivators shows a wide range from 20 to 50 per cent of the gross produce. Similarly, in some States as yet no provision exists for bringing its tenants into direct relationship with the State, or for an operational ownership right of purchase except in respect of surplus land vesting in Government.

Studies conducted by the *Programme Evaluation Organisation of the Planning Commission* have revealed that there has been two-fold adverse effect of land reform. On the one hand, the ex-landlords, the jagirdars, the zamindars resumed cultivation (but only on paper) and yet they showed complete indifference to the maintenance of capital works, such as wells, tanks, improvement on soil; on the other, they diverted investment funds in trade, financial assets, gold and silver. Both of these factors have tended to affect investment and production adversely.

An American Expert Shri Ladenjinsky, who made an intensive study of agrarian conditions in the five districts Thanjour, Ludhiana, West Godawari, Aligarh and Shahabad under the Package Programme observed about Thanjour district thus : “Thanjour.....was a district with one of the nations worst land tenure system....Some 20 per cent of the tenants hold oral leases which deprive them of any legally enforceable tenurial status. Although the law prescribes that the owner shall not be entitled to more than 40 per cent of the produce as rent, such is the pressure of population on land.....that landlord often appropriates 50 to 60 per cent of the crop or more... A landlord owning less than the ceiling can in certain circumstances resume lands leased by him prior to 1956....Eviction is permissible for non-repayment of rent. The whole tenancy position is obscure because of the absence of a record of rights.....the entire tenurial system is sanctified by tradition.”³

1. *Report of the Committee on Distribution of Income and Levels of Prices*, 1964, pp. 20-21.

2. Singh, B., *Next Steps in India*, p. 33.

3. Quoted as K. N. R. in *Some Current Hypotheses*, *Mainstream* October 19, 1964, p. 12.

Nanda Committee's Findings

Land Reforms Implementation Committee was set up in 1963 (which reported in 1964) under the Chairmanship of Shri G. L. Nanda. It brought out many unpleasant features of land reforms legislations and implementation and sounded a warning that delays in implementation of land reforms were apt to create uncertainties and hamper agricultural production programmes in the Fourth Plan. It highlighted the following gaps :

- (i) Administrative arrangements for enforcement and supervision were often inadequate.
- (ii) Records of tenants did not exist in several States and were often incomplete or out of date even where they existed.
- (iii) The economic condition of tenants was poor.
- (iv) In several States, the existing provision for security of tenure were of an interim nature and comprehensive measures to bring tenants into direct relation with the State had yet to be adopted.
- (v) Most ejectments took the form of "voluntary surrenders" forced in fact but voluntary to the outward view.
- (vi) The rights to resumption widened the scope of ejectment.
- (vii) In several States, rents have yet to be brought down to 1/4 of the gross produce or less.
- (viii) To provide security of tenure to the tiller the landlord-tenant bond had to be broken by the State interposing between them to collect fair rent from the latter and pay it to the former after deducting land revenue and collection charges.
- (ix) Although legislation for ceiling had been adopted steps for dealing with the problem of *benami* transfers have yet to be adopted in several States.

Planning Commission's Survey on Progress of Land Reforms

A survey was undertaken by the Planning Commission in 1966 of the progress on land reforms. It brought to light the following defects. The broad conclusion was that in many States reforms pertaining to fixity of land tenures, fixation of fair rents, enforcement of ceiling on land holdings and acquisition of ownership rights by cultivating tenants and settlement of cultivable waste lands on agricultural and landless labour families have made little progress in many States."

"About 82 per cent. of the total number of tenants in Andhra Pradesh, Assam, Tamil Nadu, Bihar, Haryana and West Bengal do not have fixity of tenure and are either tenants-at-will of the lands which they cultivate or are subject to the landlords' right of resumption or enjoy temporary protection. In areas where intermediary

tenures did not obtain, there has been considerable leasing of lands and sub-leasing in areas where such tenures existed earlier and these are largely of an informal nature without any written documents or records. There is practically no restriction on leasing in many of the States as, for example, Andhra Pradesh, Punjab, Tamil Nadu, West Bengal and Bihar.

"A significant lacuna in the Tenancy Acts relating to leasing of lands is the ambiguity in the definition of "personal cultivation," and the right of the landlords to resume possession of the leased lands on the omnibus plea of "personal cultivation" remain a continuing right. This plea, which is a crucial determinant of the fairness of the claim for resumption of land from cultivating tenants had so many loopholes that the statutory protection afforded to the latter has in many cases proved illusory."

As Prof. Gunnar Myrdal said, "Neither manual work nor year-round residence near the land was required ; nor was the requisite amount of supervisory activity by the landlord clearly stipulated. In nearly all States land under personal cultivation would thus continue to be cultivated by share-croppers, if necessary, disguised as agricultural workers. It is not surprising that the preparation and passing of these bills (land laws) brought a wave of evictions of tenants and resumption of land for so-called personal cultivation.

Further, "evictions of tenants had occurred on a large scale under the guise of "voluntary surrenders," which are forced on account of the diverse limitations in securing credit and so on by the tenant farmers. Undoubtedly provisions are incorporated in tenancy laws which obligate verification by revenue authorities of such surrenders, for example, in Bihar a tenant evicted except under the "due process of law" is entitled to restoration. In Assam, Gujarat, Kerala, Maharashtra, Madhya Pradesh, Karnataka, Orissa, Punjab, Rajasthan, Manipur, Tripura and Himachal Pradesh rights have been conferred to a cultivating tenant to receive compensation from the landlord for money spent by him on improvement of the land. But such provisions have been ineffective in preventing forcible evictions."

"The most blatant cases of evasion have, however, been in respect of laws pertaining to ceilings on land holdings which have tended to defeat in practice the laudable objective of the legislation in that respect. This is apart from the fact that the criteria for fixing ceilings under law in different States are flexible and that they are a multiplication of family holdings, the computation of which again differs from State to State.

The Planning Commission has suggested that restrictions should be imposed on all transfers of surplus land above the ceilings since 1953 and also that all transfers that have already taken place and the manner in which exemption provisions had been implemented should be reviewed. But apparently none, if any, of the States have

undertaken this exercise, with the result that a large number of *benami* transfers of ownership among different members of a family escaped scrutiny. There has also been considerable delay in the surrender of land surplus to ceilings by the erstwhile holders, or in some cases State Governments, e. g., Andhra Pradesh, have been unable to mobilise the resources for paying compensation to the landlords for acquisition of land surplus to ceilings or as in Bihar and Orissa enforcement of the law has been held up due to litigation.

While legislation fixing the maximum rents at one-fourth of the gross produce has been adopted in Assam, Bihar, Gujarat, Maharashtra, Karnataka, Orissa, Rajasthan, Telengana area in Andhra Pradesh, and in a number of Union Territories in some States they are even less and in other States they are higher. Even where statutory rents are in conformity with the directions of the Planning Commission, they lend themselves to evasion in devious ways, one of which is the non-issue of receipts for rents paid or issuance of false receipts for statutory rents while actual rents are higher.

Broadly, therefore, administration of the land laws so far adopted has been on the whole lax, if not too lax and permissive, if not too permissive. The laxity also stems from the lack of interest in the revenue officials in different States in the implementation of the legislation.

However, there is some improvement in recent years in States like Gujarat, Maharashtra, Uttar Pradesh and to some extent in Madhya Pradesh, Haryana, Jammu and Kashmir, Punjab and Rajasthan but in other States "records of tenants do not exist or are often incomplete and out of date even where they exist". To add to these are the weak budgetary support to land reform measures the illiteracy and ignorance of most tenants, the dual role of many owners as both landlords and moneylenders, the heterogeneous interests of the village population and the social differences that separate the tenants from the landless.

The picture that emerges may be summed up in the words of a recent official review as follows : "As of now land reform measures have not benefited the actual tiller of the soil in all cases ; there is considerable concentration of ownership. Much of the land is cultivated in small holdings by tenants and share-croppers who lack security of tenure or who have to pay exorbitant rents. Inequalities in land holdings have persisted because of the failure to implement ceiling laws. The programmes so far implemented are still more favourable to the larger owner than to the small tenant farmer. As for the share-croppers and the landless labourers, they have been more often than not left in the cold. Because of these factors, disparities have increased accentuating social tensions."

In the re-organisation and development of the economy, land reforms have a place of special significance and they provide the proper socio-economic base and institutional framework for bringing about planned agricultural revolution.

Observation of the Task Force

According to the *Task Force of the Planning Commission*, the main reasons for the poor performance of land reforms programme have been :

(i) *Lack of Political Will*. "In the context of the socio-economic conditions prevailing in the rural areas of the country, no tangible progress can be expected in the field of land reform in the absence of requisite political will. The sad truth is that this crucial factor has been wanting—In no sphere of public activity in our country since independence has the hiatus between precept and practice, between policy-pronouncements and actual execution, been as great as in the domain of land reform."

(ii) *Absence of Pressure from Below*. "Except in a few scattered and localised pockets, practically all over the country, the poor peasants and agricultural workers are passive, unorganised and inarticulate. The basic difficulty in our situation arises from the fact that the beneficiaries of land reform do not constitute a homogeneous social or economic group."

(iii) *The Attitude of the Bureaucracy*. "Towards the implementation of land reform is generally lukewarm, and often apathetic. This is, of course, inevitable because, as in the case of the men who wield political power, those in the higher echelons of the administration also are substantial landowners themselves or they have close links with big landowners."

(iv) *Legal hurdles*, also stand in the way of implementation of land reforms. The Task Force categorically states : "In a society in which the entire weight of civil and criminal laws, judicial pronouncements and precedents, administrative tradition and practice is thrown on the side of the existing social order based on the inviolability of private property, an isolated law aiming at the restructuring of property relation in the rural area has little chance of success. And whatever little chance of success was there completely evaporated because of the loopholes in the laws and protracted litigation."

(v) *Absence of Correct Upto-date Land Records*. The absence of land records further added a good deal of confusion. It is because of this that no amount of legislation could help the tenant in the court unless he could prove that he is in fact the tenant. This he could only do if there were reliable and up-to date record of tenants with presumptive evidence. The main reasons for the unsatisfactory state of affairs are the following : (1) many of the areas in the country have never been cadastrally surveyed ; (2) in some areas where cadastral surveys were done for a long time, no resurveys have

been taken ; (3) no machinery of any kind existed for maintaining village records ; (4) even where records were kept by Government officials, there is no uniform system, (5) it has been found that even official records in many cases have not been correct.

(vi) *Lack of Financial Support.* The lack of financial support plagued the Land Reform Act from the beginning. No separate allocation of funds was made in the Fifth Plan for financing land reforms. Many states declined to include even expenditure of such essential items like preparation of records of rights, in their Plan budget. The State Plans which are nothing but aggregate of expenditure programmes hardly made any reference to land reforms, whatever funds were needed for finalisation of this programme had to be provided in the non-Plan budgets. It is because of this that the expenditure for land reforms was always postponed or kept to the minimum.

(vii) *Land Reforms has been Treated as an Administrative Issue.* The implementation of land reform is not an administrative issue. It is more of a political issue and consequently, it is necessary to strengthen the political will for implementing land reforms. The Task Force of the Planning Commission in a very forth-right comment states ; "It should, however, be clearly understood that the mere setting up of an efficient administrative machinery will not by itself lead to any substantial improvement unless the political and economic constraints operating against the programme are removed."

(viii) *Components of Land Reforms have been Treated as Disjointed Programmes.* The major reason for the failure of land reforms in India was that the programme of abolition of intermediary tenures, tenancy reforms and ceiling on agricultural holdings were treated as disjointed programmes while intermediary approach would have yielded much better results.

The Task Force observed that "any administrative machinery by itself will not lead to substantial improvement in the field of land reforms unless political and economic constraints operating against the programme are removed." It, therefore, had indicated certain guidelines for improving the implementation of land reforms throughout the country.

In the first place ceiling on holdings and distribution of surplus lands involve identification of the persons or families having land above the ceiling in the State, locating and identifying all the plots of land in the possession of every such person, family both according to record of rights and in reality. This will involve tracing benami and clandestine transfers of property made to friends, relatives or other persons through fictitious transactions : initiating legal processes for vesting all surplus of land including land held benami : taking over possession

vested after completing the required quasi-judicial and administrative processes : distribution of surplus lands : providing supporting services including credit to the assignees of surplus lands and taking effective action to prevent the transfer of newly assigned land to the old trinity of landlords, money-lender and trader of rural India.

Secondly, so far as security of tenure and prevention of land renting is concerned, the most important requirements would be recording the names of all persons who hold land, including share-croppers in the record of right ; ensuring that not more than the legally stipulated share of crop is taken from the share croppers by landowners ; ensuring that no ejectment takes place either on the basis of voluntary or through other extra-legal or illegal methods ; ensure inheritance to the heirs of the share-croppers on their death where law provides it, and providing supporting services including credit to share croppers to free them from the clutches of landowners and money-lenders.

Thus, in order to implement ceiling laws, the most important pre-requisite is to undertake complete cadastral survey of the lands held in ownership by different families in the villages and for this purpose, proper historical records of right must be maintained.

This will enable the government to know the amount of land held in ownership before the introduction of ceiling legislation and the manner in which it was dispersed among the members of the family. Since the basic problem of security of tenure is to protect the tenancy rights of share croppers mere recording of name in the record of rights will not guarantee security of tenure, conditions will have to be created for breaking the stronghold of the landlord, money-lender and trader in the villages and for this purpose, fearless people's committees and vigilant cells in each village may be formed. As such, the judiciary need not be involved, as has also been decided recently by the State Governments in any stage in the implementation of land reforms. For this purpose, it would even be advisable to set up a land reforms commission vested with powers to review the implementation of land reform in various parts of the country.

As suggested earlier, the Land Reform Committees should be made responsible for the implementation of land reforms and could also help the administrative officers in this job. The Task Force set up by the Planning Commission had also strongly recommended that a certain degree of politicalisation of the poor peasantry on militant line is a prerequisite for any successful legislative administrative action for conferring rights and privileges on them. Otherwise, there is always the possibility of such conferment of rights not only becoming illusory but also turn out to be positively harmful as the vast majority of the beneficiaries would succumb to the pressure of landowners and would relinquish their rights and privileges either voluntarily or through open and naked coercion.

In this connection, it may also be added that the controversy over land ceiling will not cease unless steps are also taken to place

the similar ceiling on individuals' family income and assets in other sectors of the economy.

The *Draft Five Year Plan* (1978-83) observes that "out of about 2 million hectares of land declared surplus, hardly 25 per cent of the area has been distributed. Only about 1/3rd of the land distributed has accrued to the members of the scheduled castes and scheduled tribes. This slow progress is due to the unsatisfactory implementation of the ceiling laws Several States are yet to bring their tenancy laws in line with the National Policy with regard to regulation of rent, security of tenure and conferment of ownership rights..... The will to implement the policy of a more equitable distribution of land resources has been sadly lacking." The Plan, therefore, provides that "the ceiling legislation would need to be enforced more vigorously so that the programme of distribution of ceiling surplus land could be completed. Attention will be directed towards bringing about changes designed to eliminate legal and procedural bottlenecks and circumvention of the ceiling law. It will be necessary to ensure that :

- (i) the land declared surplus to the ceiling is taken over by the state.
- (ii) it is distributed and physically delivered to the eligible categories expeditiously.
- (iii) the land records are mutated to reflect their rights, and
- (iv) the allottees are given adequate financial, material and technical assistance to bring the land under productive cultivation.

Regarding tenancy reform the Plan states that "the land should belong to the tiller except for categories subject to disabilities, occupancy rights should be conferred on tenants, and share croppers. The indefinite rights of resumption should be extinguished The land records will have to be continuously updated..... The consolidation of holdings will be a key programme in future."

For better implementation of land reforms, it is necessary to involve the beneficiaries by setting up of village committees. For this, action may be taken in two directions. One, giving substantial representation of the beneficiaries, on the committee, and *second* vesting these committees with adequate powers in implementing the land reforms legislation.

POLICY ISSUES FOR FUTURE

As long as the tenants continue to be weak socially, economically and politically there will be no significant improvement in the situation. Therefore, strong organisation of tenants need be organised.

Only a small portion of the total cultivated land in India is under tenancy and absentee land-ownership and widespread incidence

of share-cropping characterised by insecurity of tenure and extortionate rents continue to be the two formidable obstacles to the modernisation of agriculture. Therefore, the policy of "land to the tiller" should be faithfully followed. The ownership rights in land should go to the persons who work on it as tenants or hired labourers. None should be allowed to own land unless he has also been cultivating it by his own personal labour. The aim should be to put an end to absentee land-ownership and at the same time encourage owner cultivators to raise output by putting their land to the best possible use.

The definition of 'personal cultivation' should be properly revised and the amended law is strictly enforced. It should also be provided that all transfers of agricultural land in future should be only to persons who reside in the same village in which the land is located or in an adjacent village. Some landholders who own less than 5 acres of land may be legally permitted to lease out their land; and the absentee landlords compelled to give up their lands. Such land may be taken over by the government and distributed to eligible categories of persons. The effective enforcement of such a law will make more land available for redistribution than is likely to become available on the enforcement of the present ceiling laws.

The existing laws should be strictly followed. In the sphere of implementation a matter of foremost importance is to build up quickly tenancy records and maintain them up to date by periodic revision. In the states in which the records have not been accorded presumptive evidentiary value, laws should be enacted on the lines of recent enactments of Tamil Nadu and Bihar. The entire administrative machinery should be geared to carry out a drive for identifying tenants and recording their names. Organisations or ad hoc bodies of tenants should be associated with the work of preparation of record of rights; and subsequently all tenants who were in possession of land on a specified date may be declared owners. Ownership rights may be conferred on tenants in respect of a minimum area without being required to submit petitions or pay any compensation. Such a step will benefit millions of small peasants.

Finally, not only security of tenure should be given, but efforts should also be made to ensure that small farmers get credit from co-operatives and banks so that economically their position may be improved.

BHOODAN MOVEMENT

The Mission and Philosophy of Bhoodan

'Bhoodan' is formed of two words *Bhoomi* (land) and *Dan* (donation). In other words *Bhoodan* is the voluntary contribution of land from the 'haves' to 'have-nots'. Gift of land was a common practice in olden days, commonly known as *Muafi*, i.e., gift of land or giving the land in charity, either to gain favour of God or for some religious deeds. But Vinobaji's Bhoodan is free from any

motive and, if at all any, that too is novel and fruitful. "Land" says Vinoba, "is the mother of all and everyone has a right to serve her. The landless have an equal claim to it." He further defines it as "free gift of nature," which "like air and water belongs to no individual but to God and every body is entitled to share it and enjoy its yield. That is why we do not beg for gifts but demand a share to which the poor are rightly entitled." Bhoodan underlines "the spirit to help to create a non-violent atmosphere." It says, "generate such an environment that you solve your problem yourself" In the words of Dr. Radhakrishnan, "the movement is preparing the public mind for a drastic and economic revolution which will be brought about by consent, not by coercion." Further appreciating Shri Bhavé's efforts he says that "the Bhoodan has ushered in a new chapter in the socio-economic reconstruction of the country".

Villagers understand the simple philosophy of Bhoodan much more than the sophisticated town-dwellers. Pressure can never make people donate land. They donate because the philosophy has appealed to them. The Bhoodan philosophy is modelled on the Sarvodaya principle.

Sarvodaya Principle

Sarvodaya is a philosophy of life and its basis is that simple living is to be preferred to the complexities of modern life, as it brings more contentment and happiness which is what human beings seek. The complexities of modern life have the seed of unhappiness in them. It is, therefore, necessary to reduce these complexities to make mankind happier. Secondly, there is not enough supply of material goods in this world to be able to satisfy the ever-increasing wants of human beings. This results in the strong exploitation of the weak and help people in accumulating wealth so that their present and future wants might be satisfied as and when they arise. This results in the concentration of economic power and all the evils which are attached to it. A satisfactory way of breaking the vicious circle and solving the problem is to deliberately reduce human wants so that the available material resources might suffice to satisfy our needs. In this way, *Sarvodaya* depends on the theory of wantlessness. For all-round real progress, material progress, intellectual progress and spiritual progress should go together. Sarvodaya is a harmonious combination of spiritualism and materialism and brings about both material and moral progress simultaneously. It has got all the advantages of socialism but it avoids nationalisation of industries and concentration of economic power in the hands of few persons and it gives the utmost freedom of thought to every individual.

Why Bhoodan Movement ?

All over the world agrarian problem is the chief problem. On the one hand, there are rich landlords who do not work but grow rich by exploiting the labour of the tiller of the soil, while on

the other hand, there are the landless labourers. The problem has been solved in various ways. In Russia, the revolutionaries adopted the path of force and bloodshed. In China was followed the same method. Abolition of Zamindari took place in Kashmir without any compensation. India has got its own problems. Fortunately, zamindari has been abolished in almost all the States, but at the cost of huge sums of money paid to the zamindars by way of compensation. *Secondly*, India is faced with the important problem of food production in the economic sphere. The Grow More Food Campaign, First, Second, Third, Fourth and subsequent Five Year Plans are all to combat this evil. *Thirdly*, the rehabilitation of landless agricultural workers requires an early action. The land problem in India is being tackled on all fronts. Abolition of landlords is one device, security of tenure is another, land reform enactment is third, ceiling on land holdings is fourth and so on. But the non-violent way is the cardinal way today to solve land problem. India is known for countless ages for her spirit of renunciation. In India, honour is shown not for grabbing wealth but for giving wealth. Acharya Bhave exhorted this feeling and with his unique method based on love and sacrifice started the campaign of Bhoodan i.e., the provision of land to the landless agricultural workers.

Evolution of the Movement

The Bhoodan movement was started in Telangana in South India on April 18, 1951, with the first donation of 100 acres of land by zamindar Shri V. Ramchandra Reddi to Shri Acharya Vinoba Bhave. This land was distributed among the Harijans of Telangana. Subsequently, the movement became popular, being a revolution not from above but from below, with its foundations among the people themselves. Associated with Bhoodan Vinobaji was also launched the *Sampattidam, Koopdan, Haldan, Grihdan, Shramdan, Buddhidan, Gramdan* and *Jivandan*. Dr. Rajendra Prasad had said. "Shri Acharya Vinoba's yajna will not be completed till such time as those, who are given land received in Bhoodan do not get the necessary assistance for their rehabilitation." By the collection of land gifts and redistributing it among the landless it is expected to solve the mighty problem of providing land to the landless persons which the legislation so far failed to achieve. Bhoodan bade good-bye to the feelings like selfishness, hatred and suspicion and class-conflicts and exhorted all possession big or small, to be donated to the society's common pool for redistribution according to needs. Bhoodan's international implication was also great and far-reaching. If there was any force capable of meeting the threat of atom or hydrogen bomb etc., it was the force of non-violence only through which all social problems could be patiently solved.

Objectives

The object of the movement was to keep away from 'power' and create *Jan-shakti* or self-reliant strength of the people, a

strength which while being difficult from legal might and opposed to armed force, would be superior to them both. Call it *Jan-shakti* moral might, love-force or soul-power, its medium is love, not the empty lip service, but love accompanied by wholesome love enjoying sacrifice. And as an initial expression of the same, Vinoba called forth for a change in landownership from the hands of individual to that of society declaring that, "All land belongs to Him." Land redistribution being a minor part of it the real purpose was to raise land to the pedestal of one of the five elements to abolish its trade for all time and to provide every tiller with it to the required extent. In other words, it implied that he who eats must perform bodily labour and that manual work is as important and elevating, if not more, as any other. What we have belongs to the society, what we are is due to society. Society, therefore, is the virtual owner of what is with us and we can only act as trustees on its behalf. It aimed to bring about a peaceful agrarian revolution in the country. Describing the aims of the movement, Acharya Bhave says : "In a just and equitable order of society, land must belong to all. This is why we do not beg for gifts but demand a share to which the poor are rightly entitled. The main objective is to propagate the right thought by which social and economic maladjustments can be corrected without serious conflicts."

The basic precepts of the movement are :

- (i) Land belongs to all and its use ought to be as universal as that of air and water. Individual ownership ought to be reduced to the minimum.
- (ii) Possessors of land owning greater quantity than they could personally cultivate ought to share it with the landless, desiring to cultivate it.
- (iii) In order to create the necessary atmosphere for the elimination of economical inequality, small as well as large land holders ought to be appealed to share their land in common with their less fortunate landless brothers.

Working of the Movement

There are Pradesh Bhoodan Committees which look after the movement in their respective regions. When land gift deeds are prepared in duplicate, duly signed and attested by witnesses they are collected by the Pradesh Committee and forwarded to the Sewa Sangh, Sevagram for the signature of Shri Vinoba Bhave before redistribution of land. These Pradesh Committees form District and Local Committees and appoint even individuals for the purpose of collecting land gifts. The general method of redistribution has been explicitly prescribed and is as given below :

- (1) The date for the distribution of land is fixed several days in advance and announced seven days before the actual date of distribution by the beat of the drum. The announcement is repeated

a day before the date of distribution and efforts are made to inform the people personally of the programme. (2) During the intervening period the distribution workers inspect the donated land, study its fertility and decide the acreage for the maintenance of a peasant family with the help of the *gram panchayat* and the *patwari*. (3) The information regarding the place and the date of distribution is sent to the District Magistrate and other officials concerned to get the benefit of their help. (4) On the appointed date at the fixed place and time in the entire village gathering the landless are asked to stand up after a short speech explaining the ideology of the movement. (5) The first preference in the distribution of lands is given to the landless agricultural labourers, followed by those with very insufficient land and with no other occupations, with other categories coming next, if any land is left over. (6) When the lands for distribution are insufficient, the task of picking out the most deserving persons is placed on the landless themselves. Failing this, lots are drawn and land is allotted accordingly. (7) The donees are asked to sign a printed application requesting for land after which they are presented with certificates of having received land. The certificate is signed by the representatives of the Bhoodan Committee, the District Magistrate and the Chairman of the Gram Panchayat. (8) No fees are charged from the recipients of land. (9) The land received is expected to be cultivated by the recipient himself for at least 10 years and cultivation should start within three years of the receipt of land. (10) Special difficulties and special cases are dealt with by taking into consideration the local conditions. (11) Sometimes when the land is a little short of the requirement, it is tried to make up at the spot by an appeal for more donations.

Apart from the above principles, every possible care was taken to see that production of land does not suffer due to its distribution.

Legislation has been adopted for facilitating donation and distribution of Bhoodan lands in Andhra Pradesh, Bihar, Gujarat, M. P., Tamil Nadu, Karnataka, Orissa, Punjab, Rajasthan, U. P., Delhi and Himachal Pradesh.

The movement was later on widened into *Gramdan*, the ideal being that all land should belong to the village community as a whole. Special legislation for management of Gramdan villages was passed in Assam and Rajasthan.

Important Phases of the Movement

There are two important phases of the movement. viz., collection of land and its distribution. Shri Bhavé had an ultimate aim of distributing 50 million acres of land, i.e., one sixth of India's cultivated land among the country's 10 million landless families. It was the most difficult phase of the movement. The main reason for this was the lack of a well defined scheme of distribution. Though there is well defined process of distribution, its implementation is not as effective as the collection side. Up to the end of March 1970, about 4.3 million acres were donated. Over 1.2 million acres and 1.7 million acres were unsuitable and unproductive acres of this

donation had been distributed. The highest percentage of land distribution was in Bihar. No help of the State Government was taken in the distribution of the land, for Vinobaji said that "Government interference will change the basic nature of the movement." This argument was also supported by Dr. V.K.R.V. Rao who observed that, "Official participation would weaken this movement." Mr. V.T. Krishnamachari regarding the Government help has said, "it was not the intention that the Government officials should do the propaganda asking the people to donate the land. But by administrative action, by facilitating cultivation of land that had been given and in other ways officials could give encouragement to the movement. In other words, a sympathetic approach could be established in the field of administrative action."

The progress of the movement in different States was not uniform and more land was donated in Bihar than elsewhere, with U.P., M. P., Andhra Pradesh, Himachal Pradesh, Orissa, Maharashtra, Gujarat and Rajasthan, coming next in order of importance.

Gramdan A New Movement

Since January, 1957, the emphasis was shifted to *gramdan*. The movement, started in Hamirpur district of U.P., was subsequently extended to other States. At present it is probably the best organised in the Koraput district of Orissa. But the progress is still slower and up to the end of March 1970; only 37, 775 villages were received in *gramdan*.

A simple workable formula has been evolved of *sulabh gramdan*. The villagers sign a declaration which contains essentially four basic conditions : (i) We are giving a minimum of 5 per cent of our cultivable land for the landless of the village ; (ii) We are giving the ownership of our land in the Gram Sabha of the village our right to this land (after deducting 5 per cent for the landless) will continue ; (iii) We will create a village fund by contributing to it one-fortieth of the produce of our land and (iv) All adults of the village will form the Gram Sabha which will function either with unanimity or consensus for the benefit of all people of the village. When at least 75 per cent of the land owning people of a village have signed the declaration and at least 51 per cent of the total land has come under its purview, the village qualifies to be declared as a Gramdan village.

In *gramdan* entire land in a village is handed over to the village community. Each family is given 5 acres of land for personal cultivation while the land is cultivated by the community as a whole. The idea is that each family should have land according to its needs. The payment of taxes, *malguzari* and the repayment of *taqavi* loans are made from the output of the common land. The artisans, ironsmiths, barbers, etc., who serve the community get corn from the common land. The basis of Sarvodaya Samaj in Gramdan villages is that of economic self-sufficiency. The cultivators provide

food and raw materials and the artisans produce the necessary requirements of the village community such as agricultural implements, pots, utensils, cloths and shoes etc.

Gramdan movement was superior to the *Bhoodan* movement as (i) it made it possible to apply the Sarvodaya principles not only to land, but to entire life of the village community ; (ii) the difficulties of *Bhoodan* such as the donations of uncultivable land, legal and other difficulties of redistribution were done away with on the basis of need. It made it easier to achieve Vinoba's ideal of Sarvodaya Samaj ; and (iii) with gramdan villages it became possible to correlate the Bhoodan movement with economic planning in the country. The Second Plan recognised the fact that the practical success which is achieved in the development in gramdan villages will have great significance for co-operative village development.

Prakhaddan

The original bhoodan and gramdan movement was subsequently expanded into *Prakhaddan* movement covering the villages of whole development blocks. When at least 75 per cent of the population of a *prakhanda* (Block) or 85 per cent of the revenue villages of the block have declared gramdan, the whole block qualifies to be called a *Prakhaddan Block*. This movement has met with spectacular success in Bihar followed by Orissa, Tamil Nadu, Maharashtra and Andhra in that order.

Evolution of the Movement

1. *It creates uneconomic holding.* The term economic holding though very commonly used, still lacks a clear conception. Some have linked the term with standard of living, while others with family income and still others with employment etc. Therefore, to speak in the terms of economic holding is vague. Another term more precise 'family managed holding' can be used which means unit area necessary for production with advantage and convenient to be managed by an individual agriculturist family. For a hard worker a small holding will be economical but even for him it may be of no use in desert and in mountainous area. In most of the states the average cultivated area is less than 5 acres. For Punjab Dr. Calvert said that 63.7 per cent of the owner area was less than 5 acres. Therefore 5 acres of land available under the Bhoodan movement for a family of 5 persons should be sufficient under the existing conditions. Individually one acre per head may seem to be small but on comparing this one acre with the land per head in various States the situation does not appear to be so unhappy. On an average the land per head in India is 0.78 acre while in most of the agriculturally advanced States like U. P., Bihar, West Bengal, Tamil Nadu and Karnataka, etc. it is even below this. Rajasthan and Assam are the exceptions to it. Therefore, we can say that 5 acres of dry land and one acre of wet land may not be uneconomic but just sufficient.

2. Another criticism is that recipients are in the grip of money-lenders because they still borrow money to invest on the land. The criticism is well founded but one thing should be kept in mind that we are not thinking in terms of Western agriculture where all the farms are well mechanised. In agriculture land, labour and capital are important elements. Land we have got, labour is plentiful and in the name of capital very little money is invested. Co-operative societies should be established in the villages from where the landless labourers can get money on a very nominal interest. Government should come forward to provide cheap credit.

3. It is feared that recipients might give their land to others for cultivation, but it cannot be so because before giving the land four tests are applied which are as follows : (a) poverty of the person ; (b) landlessness of the person ; (c) capacity of the person to till the land ; and (d) desire of the person to have the land. Those who answer these tests satisfactorily are only given the land.

4. The biggest criticism regarding *Bhoodan* is the delay in distribution of land. The country is short of food and the delay in the distribution of land results in loss to the country which the country at this time can hardly afford. This delay occurs, because of finding suitable and deserving persons and if hurry is done in it, the land may go to the wrong person which will eventually mean end of this movement. Further, those who think that delay results in a fall in production are not justified because it is clearly mentioned in the precautionary measures of application form that every donor will have to cultivate the land till it is not distributed. Thus the question of the land remaining out of cultivation and the consequent fall in agricultural production does not arise.

5. Some critics previously were of the opinion that Vinobaji got land in Telangana district which was the centre of communist activities and where many landlords were beheaded and, therefore, other zamindars donated their land in order to save themselves. But this opinion had to be revised when in other peace-loving states the collection of land reached considerably high limits.

6. Another doubt was expressed by many on the ground that nearly 50 per cent of collected land is of disputed nature involving litigation and about 70 per cent of the total collection consists mostly of infertile land. As no correct and reliable statistics are available in this connection, the above per-centage is only a guess work.

7. Another view expressed against the movement is that it has created land-hunger instead of suppressing it. But this is not the case for suppressed fire is a greater potential danger than the burning fire.

8. The most important fear which arises is that it will compete with the Government plans of ceilings and consolidations etc.

As far as the question of ceiling is concerned it cannot hinder its way, because ceiling means upper limit and in our mind any piece of land given to the landless labourers will be more than this limit.

Suggestions for Improvement of the Movement

Following suggestions may be made to bring efficiency in the working of the movement :--

1. The Bhoodan Committee should be divided into 3 different groups. The duty of one should be to collect land only, while the work of the second group should be to reclaim or to improve land. But all this requires monetary help. Therefore, the duty of the third group should be to collect money. If the improved or fertile land is not given to the labourers neither the labourers will be satisfied nor will there be any rise in production. The only significance of Bhoodan then will be a change in the ownership of land.

2. The members of the Bhoodan Committee should be very strict in distributing the land. They must see that the donor may not get the land in some other's name. Therefore to check this tendency proper enquiry should be made about the donee in the village before giving him the land.

3. The movement should be carried on a well planned scheme because without it, it will be just like bullocks without yoke which can move in any direction.

4. The pace of the distribution of the land should be quickened, otherwise the dissatisfaction in the people will arise and it will be a great hindrance in its way. The idea of first pooling and then distributing the land should be given up.

Land Redistribution Schemes

Since land has been a scarce resource and till recently it was concentrated in the hands of big landlords, leaving a large number of small cultivators, and landless labourers at their mercy, hence, the need has been felt for proper distribution of land among those who are actual cultivators or landless peasants and who want to cultivate the land personally.

The land re-distribution schemes have been recently suggested by Shri B. S. Minhas, Shri V. V. Giri and Shri B. S. Sidhu. These schemes have been briefly discussed here.

Minha's Scheme

Shri Minhas has estimated that about 11.7% (or 8,464 thousand households) do not own any land out of a total of 72,462 thousand rural households. Out of these who own land, 1623 thousand lease in land and work on it : and 12,189 thousand are absentee landlords. He says that if it is decided not to give any land to the landless, the impact of the scheme can be assessed thus: (i) No household ownership is going to be larger than 20 acres, (ii) Non-land-

owning, non-cultivating households are not to receive any land : (iii) Extra land is to be distributed among the household in the four lowest size class of household operational holdings in such a way that per capita ownership of land in these four classes are absolutely equal.

Under Minha's plan, the largest ownership holding classes would lose 43.3 million acres of land. If this area is distributed among the four lowest size classes of household operational holdings (who at present are estimated to own 57 m. hectares already), then the per capita ownership of land, according to the above rule of redistribution of land, in these size classes would be 0.54 acre. Even after the implementation of this scheme, 60 per cent of the household owning 0.54 acre of land per capita but operating between 0.45 and 0.60 acre of land would still be below the poverty line.

Giri's Scheme

Shri Giri has proposed a plan for co-operative land colonisation of waste lands. If systematic and sustained programme of reclaiming the total land available for colonisation (169 m. acres), is undertaken nearly 50 per cent of such land can be brought under cultivation within a period of 5 years. Of the total net sown area, (328.5 m. acres), land available for colonisation works out to be 25.7 per cent (or 84.5 m. acres). This fact indicates that possibilities of extensive cultivation are yet available.

Dr Giri's proposal is to create farms of an area of about 1,500 to 2,000 acres. The total number of families employed being not more than 100. In a country infested with land-hunger, it is worthwhile to use the lower limit of 1500 acres so that each family can get a farm of a size of 15 acres each. This may be taken as a viable unit of cultivation for India. On this basis, about 5.63 m. families can be accommodated in the cooperative land colonisation programme; whereas the total number of peasant families in India are about 65 million. In other words only 8.6 per cent of the total households can be accommodated in this programme. In the long run, this programme may solve the problem of under-employment among the landless workers in the rural areas.

Sidhu's Scheme

Shri Sidhu's scheme assumes different size categories of land depending upon the income generating capacity of land and the pressure of population on land available. He opines that the land allotted should be able to yield an annual income of Rs. 1,200 per annum per family of 5 persons at 1960-61 prices. He suggests that:—

- (i) a minimum size of 2.5 acres per family should be sufficient for Kerala where population pressure is extreme.
- (ii) 5 acres are sufficient in states like Tamil Nadu, Assam, West Bengal, J & K. Union Territories, Bihar, Orissa, U. P. and Punjab.

- (iii) 10 acres are sufficient in states like Andhra Pradesh, Gujarat, M. P. and Maharashtra.
- (iv) 10 acres are sufficient in state like Rajasthan which has poor sandy soils and mostly unirrigated desert areas.

On the basis of this assumption, only 27 per cent (i. e. 5.36 million households) out of a total of 19.46 million households can be benefited. Shri Sidhu observes, "no amount of lowering of ceilings on holdings can provide land to hordes of the poor, whether existing or yet unborn. The size of the cake is too small. Further attempts at redistribution of land will result only in more non-viable agriculture. The need of the rural poor and for that matter of the urban poor is not ownership of land and factories respectively but work at reasonable wage."

The crux of the entire land problem is that the total surplus land available is sufficient and the number among whom it is to be distributed is in millions. What, therefore, is needed is that surplus land available should be rationed out more judiciously, followed by a package of measures of land reform and economic development.

Rural Unemployment

Introduction

Generally speaking, agriculture is a 'chronically depressed occupation'. Besides, it is over-crowded. The economic difficulties of agriculture arise in large part of technological gap, though narrower in case of Indian agriculture when compared with that in industries.¹ Statistical data for almost all countries show that net production per employee is much higher in industry than in agriculture.² The traditional agricultural sector with three-fourth of the population and with about one-half contribution to the national income has got limited opportunities for employment, because it is organised through house-holds which permit increasingly labour intensive adaptations in the organisation of work. Besides, there is maladjustment in the factors of production—training labour force with lacking land and irrigation and almost missing capital with age old know-how which results into acute problem of under-employment in the agricultural working class. If these under-employed persons can be employed in other productive work, they will become productive, and the 'potential saving' of their relative, on whom they fall back in their odd hours, may be used for employment in other productive activities.³

Types of Under-Employment

According to Robert S. Mc Namara, "Unemployment is not only robbing men of minimal means to make their way but leaving their pride broken and their ambition atrophied." Unemployment implies hardships first to the unemployed and thereafter to the society as a whole. Increase in unemployment leads to poverty and destitution affects the society as a whole bringing about social degeneration.

Problems of under-employment arise mostly in under-developed countries, as a consequence of inadequacies, not in effective demand

1. E. F. Shumacher, *Reflections on the Problem of Bringing Industries to Rural areas*.
2. O. Lange, (Ed.), *Problems of Political Economy of Socialism*, p. 78.
3. Nurske, *Capital Formation in Underdeveloped Countries*.

but in supply of means of production. Under-employment can take two forms, viz., disguised under-employment and potential under-employment. According to the U.N. Committee of Experts, "the disguised employed are those persons who work on their own account and who are so numerous, relatively to resources with which they work, that if a number of them were withdrawn for work in other sectors of the economy, the total output of the sector from which they were withdrawn would not be diminished even though no significant reorganization occurred in this sector and no significant substitution of capital."¹ *Disguised under-employment* is existing if the same amount of capital, land and institutional framework can release labour force without changing the total output by raising the intensity of work per hour, by improving the organisation of work and division of labour, and by introducing simple labour saving devices requiring little or no addition to capital outlay.

Structural or Potential under-employment is assessed by the amount of release which occurs due to more fundamental changes which in the words of Prof. Nurske are "technological advance, more equipment, mechanization, better seeds, improvements in drainage, irrigation, etc." It became more acute with the introduction of new technical devices in primary production when the other sectors of the economy do not go hand in hand and expansion is uneven.

Magnitude of Unemployment

According to the Agricultural Labour Enquiry Committee (1950-51) the level of rural unemployment was 2.8 million. According to the Second Plan this figure was maintained uptill 1956. During the Second Plan period the total addition to the working force was 11.7 million of which 7.27 million was rural. The number of jobs created during the Plan was only 8 million, the urban rural breakdown being 6.5 and 1.5 million respectively. Thus, the backlog of rural unemployment at the end of the Second Plan amounted to $(2.8 + 7.27 - 1.5)$ 8.5 million. The number of new entrants in the labour market during the course of the Third Plan was estimated to be 17 million out of which 1.3 was urban. This gives a figure of 11.4 million for rural. The total jobs planned during 1961-66 was 14 million, 10.5 million outside agriculture. Thus the total rural unemployment at the end of the Third Plan stood at $(8.5 + 11.4 - 3.5)$ 16.4 million.) As against this the Fourth Five Year Plan mentioned that the backlog of unemployment at the end of 1965-66 was expected to be only 9 to 10 million; out of which three-fourths or nearly 7.5 million is in the rural areas. Under this Plan no figures were given for unemployment or disguised unemployment. But the total addition to the working force between 1961-76 has been given as 70 million in the Third Plan document. The addition

1. U. N. O., *Report on Measures for the economic Development of Underdeveloped Countries*.

during 1966-67 to 1970-71 was assumed to be 23 million. Assuming the same urban rural ratio as under the Third Plan the addition to the labour force in the rural areas would amount to 15.3 million. Thus between 1966-67 and 1970-71 something between 22.8 million to 31.8 million jobs were required in the rural areas to absorb the backlog of the unemployment and the new entrants. This is clearly a stupendous task.

The Committee of Experts on unemployment (Bhagwati Committee) placed the number of unemployed in 1972 at 18.7 million of which 16.1 m. persons were estimated to be in rural areas and only 2.6 million in urban areas.

The most disquieting feature of unemployment has been that back-log of the unemployed has been constantly increasing from 7.0 m. in the First Plan, to 10.0 m. in the Second, 14.5 m. in the Third ; 41.4 m. in the Annual Plans ; and 18.5 to 19.0 m. in the Fourth Plan. During this period, the additional employment created was of the order of 9.0 ; 11.8 ; 17.0 ; 14.50 ; and 23.0 million respectively.

The back-log of unemployed was estimated at between 21 million and 29 m. for 1971. The N. S. S. puts the figure at 29.29 m. in 1971, composed of these three types ; openly unemployed ; 9.25 m ; severely unemployed 12.20 m. ; and underemployed 7.84 m. Since then the figure must have increased as indicated by a decline in per capita production of many commodities and manufactures in the wage-goods sector ; and increase in the number of employment exchanges. During the Five Year Plan (1978-83), the expected increase in labour force has been estimated at 30 million ; and the total of unemployed is expected to increase to 59 m. Even if this Plan is able to provide 49.26 m. jobs the back-log of unemployed would be 9.74 m.

The Five Year Plan (1978-83) has observed that "the economic development that has taken place during the last three decades in terms of industrial development, import substituting export promotion and technological progress has been appreciable but these achievements are over shadowed by the failure of achieved growth to reduce the unemployment problem."¹

The Planning Commission has made three estimates based upon the 27th Round of N. S. S. viz ; (a) *Chronic unemployment* (measured in number of persons) i. e., persons who remained unemployed throughout the year ; (b) *weekly unemployment* (measured in number of persons) i. e., persons who did not find even an hour of work during the survey-week ; and (c) *unemployment including under-employment* (measured in person days or person years) i. e. persons who had not found work in a day or some days during the Survey work.

1. Draft Five Year Plan, (1978-83) 1978, p. 81.

The Planning Commission estimated the total labour force in 1971 at 230.5 m. out of which 3.6 m. represent chronic unemployment. Assuming the labour force participation rate to be the same as in 1972-73, the estimate of labour force in 1978 worked out to be 265.3 million. This indicates a net annual addition at the rate of 5 million.

*Estimate of Labour Force, Work Force
and Chronic unemployment*

(In million)¹

Plan	Work Force	Chronic unemployment	Total
<i>Rural</i>			
1971	190.78	1.73	192.51
1973	197.80	1.83	199.63
1978	216.16	2.00	218.16
<i>Urban</i>			
1971	36.09	1.88	87.77
1973	38.46	2.03	40.49
1978	44.76	2.37	47.13
<i>Total</i>			
1971	226.87	3.61	230.48
1973	236.26	3.37	240.13
1978	260.92	4.37	295.29

The Planning Commission observed that "Chronic unemployment is a very small part of the Indian unemployment problem, because very few workers remained unemployed throughout the year." It, therefore, measures "irregular employment" based on "weekly unemployment" which implied that a person was not able to find even a hour of work during the survey work. On this basis, 10.1 m. workers in 1973 and 11.2 m. workers in 1978 were reckoned as unemployed. But as these estimates were found to be unsatisfactory by the Commission itself, it prepared estimates of "Daily status employment," which implied the country of unemployed days' rather than 'unemployed persons'. This person-day unemployment was 130 million-days per week in 1973, which is equivalent to 18.1 m. persons being unemployed as a typical day.

The following table shows the estimated Rural and urban employment in millions :²

1. Draft Five Year Plan, (1978-83) 1978, p. 81.
2. *Ibid.*,

	March ending 31,			
Type of unemployment	1971	1973	1978	1983
<i>Rural</i>				
Usual Status (Chronic)	1.73	1.83	2.00	2.20
Weekly status	7.04	7.46	8.15	8.98
Daily status	14.21	15.06	16.47	18.10
<i>Urban</i>				
Usual status (chronic)	1.88	2.04	2.37	2.77
Weekly status	2.41	2.61	3.04	3.55
Daily status	3.24	3.52	4.09	4.78
<i>Total</i>				
Usual status (chronic)	3.61	3.87	4.37	4.97
Weekly status	9.45	10.07	11.20	12.53
Daily status	17.45	18.57	20.56	22.88

The Draft Five Year Plan observes, "The unemployment rate in 1972-73 measured as the ratio of person years unemployed to person-years available turns out to be 8.2 per cent in the rural areas and 9.0 percent in the urban areas . . . in India the absolute volume of unemployment at present (20.6 m. years) is staggeringly large, and larger than in any country in the world for which any unemployment statistics are available. This fact represents the greatest challenge to Indian planning in the next phase."

It is worth noting that the new job opportunities created under planning have failed to absorb the growing work force, leaving aside solving the problem of residual unemployment. This may be attributed to the declining investment-employment ratio. For instance, against an investment of Rs. 10,191 crores in the first two Plans, 17 m. jobs were created (12 m. in the non-agricultural sector and 5 m. in the agricultural sector). In the Third Plan, with an investment of Rs. 10,400 crores, only 14.5 m. new jobs were created (10.5 m. in the non-agricultural and 4.00 m. in the agricultural sector). Efforts were mainly concentrated on capital-wasting projects. Further, as a result of increase in population, the additional labour force has also increased greatly and so also the number of agricultural workers. All this force is not only unemployed but is also underemployed for most part of the year.

The Draft Five Year Plan has estimated a total employment generation of the order of 49.2 m. person-years during 1978-83. The balance of employment gap will be of the order of 15.5 million person-years in 1983. The Plan mentions, the employment gap should fall from about 41 m. to 15.5 m. standard person-years. In other words, the proposed pattern of investment and production should reduce the employment gap by more than half."

NATURE OF UNEMPLOYMENT AND UNDER-EMPLOYMENT

The seasonal character of the agricultural operations has resulted in an uneven distribution of labour power. This waste of labour, due primarily to the enforced unemployment and under-employment, exist side by side in the rural areas. The period of complete inactivity in each agricultural region varies with the nature and variety of crops and cropping pattern. Broadly speaking, Indian cultivator is unoccupied anywhere from 4 to 6 months in a year excepting in places where he has undertaken the cultivation of wet crops or where he grows more than one crop from the same soil in a year, while the cultivators' womenfolk are unoccupied for even longer part of the year.¹

Unemployment in Rural Areas

In pre-Independent India, various experts had undertaken studies regarding the period of unemployment in different parts of the country which showed that enforced unemployment lasts on an average from 150 to 270 days in a year. For example, in some of the South Indian villages the cultivators have little or no work on the field for three months in the year at a stretch.² In Tamil Nadu, the cultivators find employment only for about 6 months, while in Bengal for about three to four months in a year.³ Juice growers were idle for 9 months while the paddy growers for 7 1/2 months.⁴ In Oudh the cultivator got employment from 150 to 200 days.⁵ In the sub-montane districts of U.P. the cultivator was engaged for 110 days' full labour and 188 days' complete leisure.⁶ In the Bombay Deccan the cultivators had work only for 180 to 190 days.⁷ In the Punjab, the cultivators had work for 150 to 278 days.⁸ In Kerala the agricultural labourer finds employment only for 140 to 160 days; while in Delhi village there was no work for more than 5 months.

After Independence, the question of unemployment among agricultural labourers was examined by the First and Second Agricultural Labour Enquiry Committee in 1950-51 and 1956-57. The first enquiry was conducted in 800 villages, covering a sample of 11,000 agricultural labour families, while the second enquiry was conducted in 3,600 villages covering a sample of 28,560 agricultural labour households.

-
1. *Third Five Year Plan*, p. 154.
 2. Thomas, M. J. and Ramkrishnan, C. K., *South Indian Villages :- A Resurvey*.
 3. *Report of the Bengal Land Revenue Commission*, p. 91.
 4. Jack, *Economic Life of Bengal District*, pp. 38-39
 5. Mukerjee R. K., *Rural Economy of India*, 1926.
 6. Lorenzo, A. M., *Agricultural Labour and Market Gardening in Oudh*, p. 144.
 7. Keating, *Rural Economy of Bombay Deccan*.
 8. *Board of Economic Enquiry, Punjab Government Publication*, Nos. I and II.

The results of these two enquiries revealed that :

1. Casual adult male workers were employed, on an average, for wages for 200 days in 1950-51 and for 197 days during 1956-57. They were self-employed for 75 days in 1950-51 and for 40 days in 1956-57.
2. Casual adult female workers were employed on wages for 134 days during 1950-51 and for 151 days during 1956-57.
3. The average wage-employment of children increased from 165 days in 1950-51 to 204 days in 1956-57.
4. Casual adult male workers were unemployed for 128 days in 1956-57 as compared to 90 days in 1951.

Wage-employment of Adult Male Agricultural Labourers.¹

Categories of agricultural Labour families	Agricultural wage employment		Non-agricultural wage-employment		Total days	
	1950-1951	1956-1957	1960-1961	1956-1957	50-51	56-57
Casual Labour	176	172	31	29	207	201
With land	162	153	28	28	190	180
Without land	191	188	34	31	225	219
Attached Labour	299	248	13	23	312	272
With land	280	219	16	28	296	247
Without land	309	274	11	18	320	292
Agricultural labour	189	194	29	27	218	222

Under-employment in Rural Areas

On the basis of the findings of National Sample Survey, rough estimates of under employment in agricultural labourers has been made as given below :²

Percentage Distribution of Gainfully Employed Persons by Occupation and days at work in Rural India.

(a) Days at work :

Occupation	0	1	2	3	4	5	6	7	Net Re-corded
Agr. Labourers	0.51	4.44	7.82	9.91	12.63	8.96	9.72	45.97	0.11

1. *Indian Labour Yearbook* for 1960, 1961, p. 318.

2. N. S. S. Report, No. 52.

(b) Weekly hours at work :

Weekly hrs at work	0	1 to 7	8 to 14	15 to 24	25 to 42	43 to 56	57 to 70	above 70 hrs.
Percent of Persons	4.77	1.43	4.27	12.34	18.37	32.09	24.14	2.69

(on the basis of 10 hrs. a day, and 7 days in a week)

Under-employment in Agricultural Labourers

	Under-employment			Fully Employed
	Severe	Moderate	Mild	
By days at work	39,81,955	99,01,089	30,53,754	1,44,50,238
By hrs at work	71,46,411	158,51,187	38,00,214	46,50,228

It will be noted from the above table that agricultural labour is much more under-employed by hours at work than by days at work.¹

According to the Agricultural Labour Enquiry Committee Report, "the extent of under-employment is on the average, 82 days of unemployment in a year for 84 per cent of agricultural labourers who have some employment during the year."

The following table shows the work pattern of agricultural labour households (1964-65) estimated number of full days in a year.²

No. of days employed in

Category of Workers	Wage Employment as Agr. Labourer	Self- employment Non- Agri. Labo- urer	Unclassified	Employ- ment on Salary Basis	Total	
Agricultural Labour Household						
(i) Men	208	27	30	6	1	272
(ii) Women	148	15	28	2	0.52	183
(iii) Children	167	35	62	15	1	280

1. *Severe underemployment*, by days, means workers working for 2 or less days in a week ; *moderate underemployment* means 3 to 5 days; and *mild underemployment* means 6 days in a week.

By hours, such underemployment means less than 28 hrs. a week from 29 to 56 hrs. a week in case of moderate underemployment.

2. *Indian Agriculture in Brief*, 1974, p. 17.

All Rural Labour Household

(i) Men	183	52	31	9	2	277
(ii) Women	137	30	29	3	0.52	199
(iii) Children	156	31	64	14	2	267

The Expert Committee on Unemployment (1973) has estimated unemployed persons at 18.7 m. of whom 9 m. (48 per cent) are completely unemployed and 9.7 m. (52 per cent) are employed for only less than 14 hrs. a week. About 16.1 million (i.e. 86 per cent) are unemployed in rural areas and 2.6 m. (14 per cent) in urban areas.

According to the National Sample Survey, 1970, as many as 22.19 per cent of the rural work force worked for less than a full week. Persons working for four days or less and upto one day come to 10.24 per cent of the rural working population.

Causes of Rural Unemployment

From the above data it would be seen that the problem of unemployment in the rural sector is rather serious and what is more important is that the problem of under-employment in the rural sector remains as intractable as that of unemployment. It is an anomaly that in many parts of the country, during the busy agricultural season, shortages of labour are frequently reported, while over the greater part of the year, a large proportion of agricultural labour and others engaged in allied activities are without continuous employment.

In this connection, the Fourth Plan observed : "In many parts of the country, there is heavy pressure of population on land. The agricultural economy is unable to provide continuous work enough for the year. The slack agricultural season frequently extends from 3 to 6 months. The growth of population, the pace at which non-agricultural activities are developing within and outside the rural economy and greater resort by owners of land to personal cultivation have tended to increase the strains of poverty for cultivators with marginal holdings and large numbers of landless agricultural workers.....Even favourably situated areas show a considerable surplus of manpower. The problem presented by chronic under-employment on the part of large numbers of landless agricultural workers is of a long term character. Very low wage levels and low levels of productivity are but symptoms of this problem."¹

We may observe that unemployment and under-employment in rural areas has been due to :

- (i) the rapid growth in population.
- (ii) the non-availability of subsidiary occupations in the rural areas.

1. *Fourth Five Year Plan*, p. 110.

- (iii) the inadequate development of non-agricultural sector from the point of view of employment.
- (iv) small holdings which keep the cultivators and landless labourers busy only for a part-time. This is accentuated by the unevenness in distribution of holdings.
- (v) the decay of the cottage industries.
- (vi) unremunerative nature of the agricultural economy, due to rural indebtedness, typical pattern of village life, illiteracy etc.
- (vii) Seasonal nature of agricultural operations causing idleness among the agriculturists.
- (viii) Scarcity of capital characterised by poor overheads and equipments and inadequacy of working capital.
- (ix) Unwillingness of the villagers to move out and leave the pastoral surroundings to take up employment elsewhere.
- (x) Existence of the joint family system which is an unofficial agency for providing relief to the unemployed.
- (xi) Prevalence of self-employment on a large scale.
- (xii) Lack of occupational mobility due to social institutions, particularly the caste system.
- (xiii) Rudimentary want structure, limited horizons and lack of aspirations which enables the farmer to be satisfied with a very low level of income.

REMEDIAL MEASURES

Agriculture even now is a depressed industry and as such full employment is not possible in agriculture. The Planning Commission observed, "Taking a broad view, an increase in agricultural production would lead to a reduction in under-employment rather than to the creation of new jobs in the rural areas. The increase in industrial production does not lead to a proportionate growth of opportunities for employment because most of the new process used in large-scale industries are based on high productivity techniques..... In this situation, it would take a good deal of time to create conditions of satisfactory full employment."¹

The remedy would be, in the words of the Planning Commission, "a continuing expansion of the national economies at a high rate to create adequate employment opportunity in the urban areas and to provide conditions for a continuing growth of agricultural production which would reduce under-employment and offer greater opportunities of work for landless labourer and similar occupational groups..... Sustained programmes over a period of years for the rapid development of agriculture and expansion of modern industries and the diversification and strengthening of the rural

1. *The Third Five Year Plan—A Draft Outline*, p. 85.

economic structure will be the only solution to the problem of unemployment."¹ Since increase in agricultural production depends upon better, higher and also a rational level of inputs and investment in agriculture and techniques adopted, more attention should be paid to these aspects. Schemes for increasing agricultural production are closely bound up with improvement in animal husbandry, dairy farming and development of fisheries. All these should find increasing share of development expenditure.

For the balanced regional development decentralisation of industries should be aimed at by substantial allocation of infrastructure investments in semi-urban and rural areas, external economies and supporting financial and other services, and the setting up of industrial estates in rural areas after rapid electrification of such areas. Such a kind of investment would easily lead to substantial economies in such overhead investments because of relatively low cost of transportation, water supply, land, etc., in smaller communities.

Surplus labour should be put to such capital formative activities which are labour intensive and require "a minimum draft on equipment and materials, and in cases of short gestation periods and the possibility of promoting a wide extension of these activities over the whole country."² Such labour power may conveniently be utilised for the extension of afforestation and in arid areas for canal, and road construction, land reclamation, bunding, terracing, surface drainage, minor irrigation projects, etc. Prof. Nurkse has observed that, "the productive labourers perform virtual savings, they produce more than they consume, but the saving runs to waste, the saving is abortive, it is offset by the unproductive consumption of the people who could be dispensed with, who contribute nothing to output. So if this saving could be made available, we can have multiplying effect on employment."

Means of transport should be properly developed, especially in the remote areas, forested regions, and mining areas so that surplus labour could find relief in going over to these areas for livelihood. Emigration from thickly populated parts to newly reclaimed, irrigated and colonized regions should be undertaken with greater intensity.

The Planning Commission rightly observes that "A permanent solution can only be achieved through the development of a system of scientific, diversified and assured agriculture, the building up of a wide range of small and processing industries in rural areas, rural electrification, growth of new skills, and general economic and industrial development..... By putting available manpower resources to productive use, agricultural and economic development can be accelerated. In areas in which there is considerable rural

1. *The Third Five Year Plan*, p. 163.

2. I. L. O., *Report on Employment Objectives in Economic Development*, 1961.

unemployment and under-employment, whose economy has remained markedly under-developed, the productivity of substantial sections of the rural population can be increased through special rural programmes. Their labour can be harnessed for strengthening the local economy and assuring minimum purchasing power and improved level of living.”¹

The I.L.O. Branch in India suggests that the policy of employment in rural areas should cover the following points :²

- (i) It should be a major policy to provide work for all who seek it.
- (ii) The plans for providing employment should be of a kind that help economic growth.
- (iii) Employment policy should place special emphasis on broad-based programmes for promotion of productive employment in the rural sector.

It, further, pointed out that, “work has to be provided to: (a) all those who are able-bodied and want work all the year round ; (b) to those who are employed only during the busy agricultural season and need work during the slack season ; and (c) to those who are employed fully.”

The main line of action that need to be taken into consideration is that utilisation of the idle and leisure hours of the employed. Unemployed and under-employed masses should be our aim. Diversification of the rural economy through rural industrialisation with special stress on improving the technology in the existing rural industries and introducing new industries suited to the conditions of different regions is, therefore, one of the major economic and social requirements of the country.

A Committee on unemployment was set up under the chairmanship of justice M. Bhagwati, which reported in 1973. The Report strongly emphasised that minor irrigation and rural electrification programmes should be speeded up, and that the scheme for an agro-service centre should be implemented on a high priority basis as it has high potential for providing employment and self-employment to engineering graduates and technicians in the rural areas. The Committee also suggested schemes for road building and rural housing, with a view to alleviate rural under-employment and unemployment.

Since April, 1977 a vigorous programme of rural industrialisation is being pursued. Shri Morarji Desai has stressed the need for improving infra-structure and provision of social services to increase employment potential. In this process of rural industrialisation, the infrastructure in the form of rural electrification, irrigation and

1. *Fourth Five Year Plan*, pp. 110-111.

2. I. L. O., *The Promotion of Employment in Rural Areas in India*, 1963.

transportation are required to play an important role. The Draft Five Year Plan has laid before it the perspective of "the removal of unemployment and significant under-employment in 10 years... and towards this end the major thrust will be on achieving substantial progress towards the aim of full employment." This Plan gives highest priority to job-intensive and self-employed sectors, with clear-cut measures for making other sectors more labour-intensive.

The New Industrial Policy Statement (23rd December, 1977) has also strongly emphasised on the "effective promotion of cottage and small scale industries widely dispersed in rural areas and small towns.....Whatever can be produce by small and cottage industries must only be so produced"

Development of Rural Industries

Rural industries broadly embrace all industries which are run by rural people in or near their homes as a spare time or whole time occupation either as a caste industry or traditional profession. It is based primarily on the utilization of locally available raw material and skill with a little capital outlay.

India has been a land of villages and agriculture is going to remain, for years to come, the mainstay of its population. Therefore, in developing rural industries, following criterion should be kept in view :—

1. These industries should be such as can be conveniently taken up by the people in the rural areas without any encroachment on their main occupation.
2. They should be simple so that they could be taken up by them with their own labour and that of the labour of their families.
3. They should, as far as possible, involve small capital, and this should be available.
4. They should be based on the regional facilities, and comparative advantage of particular districts in regard to the supply of raw materials, availability of nearby market and the facilities of power.
5. These should have a direct and complementary relationship with the agricultural seasons and the supply of labour power.

Incidentally, these features are to be found in *agro-industries*. Their development will lead to integration of labour and establish a really balanced wholesome national economy. Besides, reducing the pressure on land, they will result in an increase in the productivity of land and improve human and cattle consumption levels.

The following industries can be conveniently developed in different parts of the country :

(1) **Industries Suitable for West Moist Regions.** The regions lie at the foot of the Himalayas and the Western Ghats and enjoy a very heavy rainfall. Most of them are riverine tracts, partly covered with forests, which yield valuable woods, bamboos, herbs, and grasses of commercial importance. Therefore, the most paying industries which can be developed on scientific lines are fishing, toddy drawing, basket weaving, rope making, mat and mattings, weaving of palm leaves, of bamboo mats and fans, and grass cutting, *moolda* and cane chair making, sawing and furniture making etc. Fruit farming is also profitable if fruits such as bananas, lemons, papayas, and jack fruits are grown.

(2) **Industries Suitable for Dry and Arid Regions.** The dry regions of Central Ganges-Jumuna Doab, western districts of U. P., Eastern Rajasthan, Madhya Pradesh and Deccan, which are not so wet as Tarai or the Western Ghats can best be devoted to flower gardening and perfume manufacturing, lac culture, *pan* cultivation, tanning, manufacture of fat and manure from dead animals, bone crushing, horn work, glue and gutt, making of lac bangles and toys and poultry farming. If marketing facilities are available, almost all districts near hill stations and the suburbs of big towns can grow into fowl-breeding centres and provide employment to a large number of agricultural labourers.

(3) **Industries Suitable for Regions in the Vicinity of Cities.** It should be the privilege of all surrounding districts of an urban or industrial centre to specialise their land for market gardening and fruit culture. Though vast areas of fertile land exist around our towns, market-gardening on a commercial scale has not yet been developed. There is an insatiable and growing demand for all kinds of fruits and vegetables in urban centres, and a plot devoted to market-gardening will not only occupy the labourer's time for the whole year, but will yield him a high income such as may not otherwise be possible. It has been found that an acre under vegetables is worth six to eight times the value of an acre under wheat, and the fact that the cultivation of heavy-yielding crops minimises the evils of small holdings and gives employment to the whole family during the period of inactivity, is sufficient proof of its importance.

(4) **Seasonal Industries.** The seasonal character of the agricultural operations has resulted in an uneven distribution of labour power. It is, therefore, necessary that such rural industries should be introduced as would adjust with seasonal feasting of the cultivators. There are particularly two periods when agricultural labour is completely out of work i. e., from middle of April to the middle of July (*Asarh*) when the crop is growing. At present the summer period of idleness is completely wasted, while during the later period there is wholesale migration from villages to the industrial areas and mining centres. The only way of checking this pendulous labour force and of stabilising agriculture is by introducing seasonal indus-

tries which will not only absorb the surplus labour but will serve to increase the purchasing power of the rural masses.

During summer when outdoor work of any kind is difficult, and even indoor work requires much physical exertion, simple industries like rope-making, basket-making, cane-work *tat. newar* and carpet making can be easily taken up. After rabi sowing there is a favourable season for collecting honey, toddy-drawing, ghee making, bangles and toy making and cocoon rearing.

(5) **Development of Indigenous Industries.** There are then the industries which require a short-term training and specialisation, *e. g.* wood carving and inlaying, brass-ware and metal work, dyeing and calico-printing, carpet weaving, paper and soap making, button making and musical instruments making, toilet requisite making, lock and cutlery and leather curing, tanning and processing work and shoe making, *etc.* There is an unlimited scope for the development of indigenous industries, and with a little initiative and assistance the idle and under-employed agricultural worker can find permanent employment and earn a comparatively large and stable income.

(6) **Development of Processing Industries.** A large number of agricultural products, some of which are mostly perishable, need condensing, canning, preserving, dehydrating, drying, smoking, pickling, and similar other processes to make them available throughout the year. To name a few, hulling of paddy into rice; grinding of wheat and other grains to *atta*; pulses into dals; sugarcane after conversion in *gur*, *khandsari* and sugar; oilseeds into oil; decoration of groundnuts, ginning, pressing and baling of cotton; pressing and baling of jute, sannhemp and mesta; bottling of fruit juices, preparation of pickles, achar, chutneys, juices, jams and jellies, dehydration of pear, pineapple processing, citrus oil; pectin and animal *etc.* These could be developed in feed from the processing of citrus fruits areas of the production of specialised crops, vegetables and fruits.

Besides, in the rice producing areas of East and South, there is further possibility of setting up of industries for rice milling, rice bran oil, straw board, soft board, card board, mattings, hats, *etc.* Likewise in the sugarcane producing areas, of 50,000 or more acres, may be developed manufacturing units for molasses, alcohol, methylated spirit, insulating material, plastic, and sugar syrups.

(7) **Processing of Animal Casings.** The small intestines of domesticated animals like cattle, sheep, goats and pigs are generally used as containers for sausages in foreign countries. But in India, it has been estimated by the Planning Commission that 90 per cent to 100 per cent of the large and 80 per cent of the small intestines of cattle and bulls as well as 10 to 15 per cent of the intestines of sheep and goats are not utilised at all, resulting in a loss of about Rs. 35 lakhs a year. This could be saved if proper steps are taken in this

direction. There are over 12,000 slaughter houses wherein some 40 million animals are slaughtered every year. Each cow or ox yields approximately 30 ft. of large and 140 ft. of small intestines, the corresponding figures for a sheep and goat being 20 ft. and 80 ft. respectively. The total length of intestines which can thus be salvaged from these animals can be easily imagined. Thus there exists a great potentiality of their development and increasing their exports.

According to the Fifth Plan the largest source of unemployment can be the tertiary sector in addition to the new job opportunities which can be created in other sectors of economy. Substantial number of workers can be employed in the construction of new and better roads, irrigation facilities, especially minor irrigation, water supply schemes, transport and communication net work, rural and urban housing and many other types of public and private works. There is a good scope of creating more work in producing, manufacturing, servicing and repairs of tractors, diesel engines, pumping sets; electric motors, harvesters, threshers, crushers, shellers and many other types of machinery and equipment being introduced in the modern agriculture. There is also much scope of employment in storage, marketing, processing and transportation of agricultural produce and distributive trade of commodities produced in other sectors. Development of banking, finance, insurance, industries in rural areas and many other facilities will also need hands. Rising incomes will lead to rise in demand for the services of the personnel engaged in providing facilities such as education, medical, health, sanitation, clothing, recreation, etc."

RURAL EMPLOYMENT SCHEMES

Following the publication of the report of the Committee on Unemployment, the Government has taken various measures to provide employment and reduce under-employment :

Rural Works Programme

Rural Industries Programme was initially started in 1962 with a view to spread the rural industries to small urban centres and rural areas. It was envisaged that the small assembly units in urban areas might be linked with the units in rural areas, manufacturing parts and components of those units. On the other hand, the small units and artisans in rural areas might have facility for service in workshops set up in small towns. At a later stage, this idea was modified and stress was laid on diversification as well as balanced rural economy. This idea came to be known as *Co-operative Agro-industrial Economy*. Lately, the idea of rural industrialisation has been expanded to include full scale development of modern mechanised small and medium scale industries.

Originally 49 areas were selected for implementation of the programme. Each area was divided into 3 to 5 blocks which covered a population of 3 to 5 lakhs. Out of an outlay of a detailed

survey of the potentialities of the area was undertaken and on this basis of the survey agro-industrial units were started. The rural industrialisation programme covered 49 selected areas, consisting of 16,500 villages and 119 lakh individuals i. e., the programme covered 29 per cent of the total number of villages and 43 per cent of the total population.¹ This programme was launched with a view to create additional employment opportunities and harness the larger Rs. 150 crores it was envisaged to provide work for 25 million persons for 100 days a year during slack season, only a sum of Rs. 19 crores could be made available for rural works programme which would have given work to about 1 million persons for 100 days in a day during the Third Plan. During the Fourth Plan a sum of Rs. 100 crores was set aside to provide jobs to 1.5 million people in the slack season under the rural works programme.

Rural Works programme, if undertaken and implemented in needy areas can restore to the village economy, vitality and strength, which indirectly reduce exodus of rural people to the urban areas. "It should be stressed that since the Rural Works Programme comprises a large number of small works which are inevitably spread over many villages or groups of villages, its efficient organisation requires special attention. The principal emphasis should be on efficiency and on the intensity with which the programme is implemented to ensure more effective implementation, while individual schemes have to be executed at the block level, for planning and for linking up the rural works programme more effectively with other development programmes, the overall "responsibility should be at the district level."²

Crash Scheme for Rural Development

During 1971-72 the Government of India launched a Crash Scheme for rural employment with a view to alleviating unemployment and under-employment in rural areas. The Scheme has been in operation in areas not covered under employment oriented schemes related to small farmers, marginal farmers and rural workers. This Scheme was to cost Rs. 50 crores per annum. This Scheme had two-fold purposes. *Firstly*, each project was to provide employment for 1,000 persons on an average continuously over a working season of 10 months in a year in every district. *Secondly*, each project was to produce work of a durable nature. Labour intensive projects undertaken under the scheme were road building, reclamation and development of land, drainage, minor irrigation, soil conservation and afforestation. Through these programmes more employment opportunities were to be available for the labour in rural areas. The programmes for the development of animal husbandry, dairying, fisheries were expected to generate employment for various categories of skilled, semi-skilled and unskilled labour.

1. *Third Five Year Plan*, p. 114.

2. *Fourth Five Year Plan*, p. 114.

The period for which the scheme was taken up expired in March, 1974. But due to constraint of resources, the progress of implementation of the works taken up during 1973-74 in certain states slowed down.

The following table gives necessary data about the programme,

Year	Allocation of funds (Rs. in lakhs)	Amount released (Rs. lakhs)	Expenditure incurred (Rs. lakhs)	Employment generated (lakh man-days)
1971-72	5000.000	3373.430	3116.580	789.660
1972-73	5040.745	4711.395	5334.480	1344.070
1973-74	4233.550	4178.000	4265.880	1023.660
Total	... 14274.295	12262.825	12716.940	3157.390

The scheme aimed at providing employment to at least 1,000 persons in every district. In terms of man-days, the minimum target was 525 lakhs and maximum target 875 lakhs. During 1971-72, employment was provided on an average, to about 1,500 persons per district for 150 days. In 1972-73, about 2,500 persons were so provided with employment. During 1973-74 employment was provided on an average to about 2,000 persons per district.

The Crash Plan could not succeed in removing rural unemployment because efforts were not made to organise the army of rural unemployed into appropriate supply camps to be shifted to places of demand at the desired minimum wage. The Auditor General in his report to the Lok Sabha (presented in August 1974) brought out the tragic fact that various 'Crash' and 'rural development programmes', on which the Central Government had spent Rs. 170 crores during the Fourth Plan had been wholly infructuous.

SFDA, MFLA AND DPAD SCHEMES

Small Farmers Development Agencies (SFDA), the Marginal Farmers and Agricultural Labourers Agency (MFLA) and the Drought Prone Areas Programme (DPAD) are other schemes for employment.

Under the (SFDA), the objective is to make available to small farmers credit to enable them to make use of the latest technology to practice intensive agriculture and diversify their activities.

Under (MFLA), the families are assisted with subsidised credit support for agricultural and subsidiary occupations, like dairy, poultry, piggery-rearing, fishery, horticultural operations etc.

Under the (DPAD), the purpose is to mitigate the impact of severity of drought, to optimise the utilization of all resources in the area and to improve the living conditions of the rural poor who suffer most in times of scarcity and drought. The integrated development includes development of irrigation, soil conservation

and afforestation, changes in crop practices, livestock development, and restructuring of cropping pattern and pasture development.

Three important features of these schemes need be mentioned. *First*, these are devoted to the very poor of rural areas. In the (SFDA) and (MFLA) schemes, the farmers identified as small farmers are those who possess land from one to three acres. Farmers with land holdings below this limit are categorised as "marginal farmers". "Agricultural labour" is defined as covering those rural household which derive more than 50 per cent of their income from agricultural wages. The (DPAP) scheme is meant for those areas which regularly experience drought.

Second, these schemes are by and large labour-intensive, quick maturing and providing direct employment to the needy. In addition to advancing credit assistance to small and marginal farmers for productive agricultural operations, a number of productive projects fall under these schemes such as minor and medium irrigation, afforestation and soil conservation roads and drinking water supply, cattle development, sheep-rearing, dairying, etc.

Third, these schemes provide two types of help. *One* is assistance, financial and non-financial (e.g., SFDA and MFLA), to farmers to make them viable; *two* direct employment to very poor farmers and labourers on the various civil works projects of the government. Under the *Minimum Needs Programme*, a provision exists for direct employment for the construction of rural roads, a programme of drinking water supply in rural areas and a construction programme for education, primary health centres, etc. The *Pro-gramme for Integrated Rural Development* envisage expansion of activities in agriculture and allied occupations as also to non-agricultural sectors.

Food for Employment Programme

A new programme of Rural Employment was introduced from April 1977 for a period of 2 years, viz., "Food for Employment" Programme. The objectives of this programme are three fold :

- (1) Better maintenance of public works (in the State and those belonging to the local bodies) on which investments have been made in the past.
- (2) Utilization of surplus foodgrain stock of the central government as a resource for meeting the additional expenditure required for this purpose.
- (3) Generation of additional employment opportunities in the rural areas.

This scheme has subsequently been enlarged to cover on-going Plan and non-Plan schemes and new items of capital works and execute work projects throughout the year instead of limiting their execution to the lean period of 4 months. Works projects that can be taken up under the scheme are :

- (i) minor, medium and major, irrigation works ;
- (ii) flood protection, drainage and anti-water logging measures ;
- (iii) soil conservation works and afforestation on government and community lands ;
- (iv) roads ;
- (v) construction of intermediate and main drain, field channels and lands levelling in the Command Areas ;
- (vi) school buildings and community centres belonging to the government and local bodies.

The foodgrains, viz., wheat and millo are released to the states in instalments according to their requirements.

Employment in Non-Agricultural Sectors

Needless to say that the permanent solution to the rural unemployment is to direct such people to non-agricultural sectors. In these sectors, employment can be generated through :

- (i) development of infra-structure such as rural electrification, rural roads, housing etc.
- (ii) agro-service centres.
- (iii) professional services such as barbers, cooks, cobblers blacksmiths, by upgrading their skills;
- (iv) development of tertiary sector covering marketing, trade, processing, distribution, transport, etc.
- (v) growth of village and small industries ; and promoting the decentralisation of industry from urban to rural areas.

Efforts in the direction of providing employment in non-agricultural sector must conform to the following guidelines :

- (a) It must provide new and improved work places as near as possible to where people live in the rural areas.
- (b) It should be cheap enough to be created in large number of places without making impossible demands on savings or imports, i.e., investment per work place should be related to the income per head.
- (c) Production method should be simple and should place least possible reliance on imported material, different skills, and complex organisations.
- (d) The production should be directed mainly to meeting local needs and using local and indigenous raw material.
- (e) The crucial importance of appropriate technology with labour intensive bias should be recognised and stressed.
- (f) The crucial role of marketing for the products of agro-based and other rural industries must be emphasised.

Cottage & Small Scale Industries

Cottage and Small Scale Industries

The village and small industries sector consists broadly of : (i) traditional cottage and household industries (viz., handloom, khadi and village industries, handicrafts, sericulture and coir industry), and (ii) modern small scale industries.

The term 'cottage industry' and 'small-scale industry' has been variously defined by different Committees and Commissions like the Industrial Commission, the U.P. Industrial Organisation Committee, the Royal Commission on Agriculture, the Central Banking Enquiry Committee, the Bombay Economic and Industrial Survey Committee and the National Planning Committee.

According to the *Fiscal Commission*, 1945-50, the *cottage industry* is "one which is carried on wholly or primarily with the help of the members of the family either as a whole or a part-time occupation," while a *small-scale industry* is "one which is operated mainly with hired labour, usually with 10 to 50 hands and not carried on in the cottage of the worker as the resources of the produce are limited. It included all units or establishments having a capital investment of less than Rs. 7.50 lakhs." The *Commission* further observed that "cottage industries are associated with agriculture and provide part-time occupation in rural areas, small-scale industries generally provide whole-time occupation to their workers and are located in urban or suburban areas. No definition, however, can avoid overlapping and afford a clear line of demarcation between cottage and small-scale industries."

Earlier the small scale enterprises were defined as undertakings with a fixed capital investment of less than Rs. 7.5 lakhs ; and the units having a capital investment of Rs. 10 lakhs were defined as "ancillary industries" (i.e., those supplying components, etc. to large scale industries). But in 1974, the Small Scale Industries Board revised the limits of capital investment, in view of the rise in prices, to Rs. 10 lakhs for the small scale units and Rs. 15 lakhs for ancillary units. A new category of very small industries known as tiny sector, with an investment of Rs. 1 lakh was also created.

Following are the chief characteristics of the cottage or "household industries" :

(1) Such industries are decentralised and scattered over the whole country and carried on by different castes. (2) They are carried on by handicraftsmen in their own homes, on their own risk, and for their own benefit. (3) They are carried on either with the help of the members of the family or with hired labour whose number does not usually exceed 10. (4) Normally the amount of capital invested is small (i.e., not more than Rs. 5,000.) (5) The necessary skill for carrying on the crafts is handed down from father to son or from the master to the apprentice. (6) The raw material is usually available near at hand while the tools needed are very few and simple and in most cases are manufactured locally. (7) Hand-power is mostly used. In some cases machine-power is used on small-scale with no division of labour. (8) The largest section of the cottage industry thrives on the local market, though some of them cater now to the needs of the foreign markets. (9) They absorb only a part of the time of the worker.

Such industries are organised by individuals with private resources and with the help of members of the household and are pursued as full-time or part-time occupation.

On the other hand, the characteristics of small-scale industries are¹ :—

(1) They are localised in urban and semi-urban areas. (2) They use machines, power and modern production technique. (3) Their capital investment is not more than Rs. 10 lakhs, irrespective of the number of persons employed. The capital investment means investment on fixed assets like land, building, machinery and equipment. Where units are functioning in rented premises, the capital valuation of such building is taken into account in assessing the prescribed limit of Rs. 10 lakhs. When calculating the value of machinery and equipment, the original price paid by the owner is taken into account. (4) They are run by small entrepreneurs or self-supporting workers and sometimes by co-operatives. (5) They employ labour on wages and use the capital of other people. (6) They produce goods for expanded markets. (7) They work on a permanent basis.

It will, thus, be observed that whereas cottage industries use traditional methods of making traditional products and are mostly located in villages and are run as "household enterprises", deriving their raw materials from local sources and selling their produce in the local markets. They are, in sum, small scale, rural, localised and technically backward.² On the other hand, small-scale enter-

1. *Second Five Year Plan*, pp. 440-45.

2. P. N. Dhar and H. F. Lydall. *The Role of Small Enterprises in Indian Economic Development*, 1961, p. 1.

prises are modern small firms in engineering and chemical industries employing modern techniques to produce modern products, and are generally located in towns or semi-urban areas, employing hired labour and using such raw materials as often come from long distances and their products are marketed over large areas.

Thus, the border line between small scale and cottage industries rests on the mechanical (or manual) processes and the range of geographical coverage for deriving inputs and selling their output.

The outstanding feature of these two types of industries is the personal character of its organisation and management in respect to the predominantly impersonal management of large scale industries.

Genesis of the Development of These Industries

Gandhiji has said that, "the salvation of India lies in the development and resuscitation of the cottage industries". In modern times, these industries have assumed even greater importance, and, therefore, need development on the following grounds :—

1. *Capital Starvation for Large Scale Industries.* India is a capital-starved country. It cannot afford large scale industries which involve great investment outlays. In this connection village and small scale industries offer a solution for the creation of large-scale employment at a cost which the country can afford. It may be pointed out that the cost per person self-employment is on an average Rs. 1,000. In the small scale sector it varies from Rs. 5,000 to Rs. 8,000 per person. The cost per person employed in machine tools industry is about Rs. 25,000 ; in fertilizers it is Rs. 40,000 ; in heavy electrical, Rs. 50,000 ; in coal mining Rs. 60,000 ; in heavy machine building plant and foundry/forging plant each Rs. 100,000 ; and in iron and steel industry it is Rs. 160,000¹. As the average per capita income is Rs. 348 per year, it requires more than 25,000 persons to about Rs. 1.00 Cr. per year and all this is needed to employ about 100 persons. Our employment must, therefore, be on a scale which can afford employment to agro-based industries in the rural sector.

2. *Serious Unemployment and Underemployment.* Agriculture is the mainstay for more than 70 per cent of her people. Yet it has by and large, been a Cinderella of economic planning. Factors like high pressure of population on land, fragmentation of holdings, illiteracy and rural indebtedness, typical pattern of the village life, acute unemployment and vast underemployment (seasonal as well as permanent) etc., have almost paralysed the rural economy. According to an NSS Report there were nearly 48 m. persons who worked with less than full intensity and about 19.54 m. who worked with intensity of a quarter or less of their full working time in 1955-56. To-day the position is worse. It has been estimated that the number

1. *Third Five Year Plan*, Appendix 2, p. 757.

of underemployed working at half or less than a quarter of their normal time is about 50 millions. At least 30 per cent of able-bodied men in our villages are underemployed. Apart from total unemployment a very large segment of the population of rural India is thus under-employed.¹ Therefore, the rural population requires a second string to their bow in the form of cottage industries in addition to agriculture as its main occupation.

3. *Poverty of the Rural Masses.* Rural areas are characterised by the poverty of its people, a wide gap between a developed and an undeveloped area, and a rapidly rising population; and low standard of living. The study of the National Council of Applied Economic Research on economic inequalities and concentration of wealth reveals that 1 per cent of the population continued to enjoy 9 per cent of the national income; while 5 per cent of the people belonging to the lowest ladder having nothing to claim. The consumption standards of 60 per cent of our people are below the national average. The per capita consumption standards of 30 per cent of the people are below Rs. 15 per month and that of 20 per cent are even less than Rs. 12 per month. Detailed calculations of the statistical data reveal that monthly average income per head in the lowest decile is Rs. 6.60 per month or 32 paise per day; in the second decile Rs. 9.60 per month, and in the third decile Rs. 11.70 per month, in the fourth decile, Rs. 13.36; in the fifth decile Rs. 17.34 and in the sixth decile Rs. 21.50 per month.

Thus, poverty can be done away with, in course of time, through the development of village industries.

4. *Heavy Rural Exodus Resulting in Stagnation in Rural Areas.* India is passing through an economic phase in which there are excessive ruralisation and deindustrialisation . . . or there are excessive urbanization and decline of village community.² Such a phase of economic transition from rural community to urban community as reflected through the movement of labour from agriculture has become a general phenomenon. "If people are asked to explain why they left agriculture, they usually give a variety of reasons the reasons actually given include better pay, shorter hours of work, better educational and transport facilities, mechanisation, the impossibility of supporting a family on a very small holding, the difficulty of rising in the social scales or of gaining access to ownership, or simply the shortage of rural housing."³ The rush to cities from the countryside "reduces agricultural output and leads to economic stagnation in the rural areas. In towns it floods the labour market, depresses wages, increases the number of unemployed and leads to such varied problems as the creation of slums, the break up of the family, juvenile

1. T. N. Singh, "Rural Industrialisation Programme," *Khadi Gramodyog*, Anniversary Number, October, 1967, p. 29.

2. B. Singh, ed., *Frontiers of Social Sciences*, 1955, p. 457.

3. I. L. O., *Why Labour Leaves the Land*, Series No. 59, 1960, pp. 13-14.

delinquency and prostitution." Unchecked, these movements could lead . . . to "unhealthy and problem-oriented urban development and stagnant self-retarding rural development."¹

Therefore, the rural sector, a source of migration and an under-privileged section of the economy needs to be revitalised through a structural change without affecting much the social mobility of rural working labour force.² The villages have to take on a new look and open up new vistas of development if the rural labour force is in space to remain where it is *rural industrialisation must be considered as a sort of offshoot of this revitalisation programme.*

5. *They are Suited to the Villages.* Machinery displaces human labour and a large scale mechanisation and industrial economy, in the present conditions, would definitely aggravate the already serious unemployment situation in the rural areas. Besides this, considerations of resources, power and organisational talent definitely circumscribes the scope of the development of large industries in the country. The rural industries may further have access to raw materials or market, thus effecting savings in the transportation and distribution charges. They may also secure cheap labour and these factors will offset the advantages of large scale economies of big industries, resulting even in lower unit cost. Besides, they involve minimum disturbances, in the traditional set-up of the people, by providing employment in places of residence.

That is why rural small scale industries still had their own everywhere. Even in USA, small units make up 92 per cent of the establishments, employ 45 per cent of the country's workers and handle 29 per cent of the volume of business in the country. Sericulture, silviculture and viticulture in France; dairying in Denmark; toy making, lace and embroidery works in Italy and Holland; cocoon rearing and poultry farming in Japan and watch and instrument making in Switzerland have contributed to rural prosperity in these countries. There is no reason why India should not also develop these industries in the rural areas with the help of provision of cheap power and technology, and good transport system. The Fiscal Commission has rightly said that. "It is the relative strength of modernised cottage and small-scale industries that account for the large place that these occupy in the economy of even such industrially advanced countries of the world as U. S. A., U. K., Germany and Japan."

6. *Unsound Agricultural Economy.* Our income from agriculture is still far behind the performance of other developing countries. For instance, India has 0.35 hectares of arable land

1. *People and Living*, Vol. 5 of Series in Science and Technology for Development, U. N. O., 1963, p. 131.

2. W. W. Lockwood, *The Economic Development of Japan, Growth and Structural Change, 1868-1938, 1954*, p. 25.

per person while national income in U.S. dollars per hectare of arable land is only 90.23. Compared with Pakistan, the corresponding figures are 0.26 hectares and 164.02 U. S. dollars ; for Ceylon 0.15 hectares and \$ 416.73 ; for Israel, 0.17 hectares and \$ 562.50; for Netherlands, 0.08 hectares and \$ 1174.72; for Japan 0.06 hectares and 10,55.28. This amount per person is quite insignificant to enable him to make both ends meet unless there is some other subsidiary occupation to fall back upon for spare time. Village industries thus provide the best solution.

Importance of Village Industries

According to the *National Planning Committee* (1938) the importance of cottage and small-scale industries for improving the economic life of the large masses of the rural people arises from various advantages which industries enjoy. They are :

(i) employment in the rural setting of the worker's own place of habitation combined with numerous physical, moral, material and other benefits that go with such employment :

(ii) finding means of livelihood for the largest number of persons ;

(iii) offering opportunities for profitable employment and development of inherent talent and aptitude in occupation which should be congenial to them ;

(iv) the opportunities of following more than one vocation for means of livelihood, particularly occupations for the cultivating classes ;

(v) the comparatively lower cost of living for a similar standard in rural areas than in urban areas ;

(vi) the increased employment in rural areas leading to spreading over of purchasing power which is confined to urban areas at present ;

(vii) they effect decentralisation of industries by creating industrial estates.

The Planning Commission attached great importance to the development of rural industries. In the *First Five Year Plan* it said : "The importance of small scale production in the predominantly agricultural economy can hardly be stressed. What is essential for economic development on democratic lines is a diffusion of sources of power and instruments of production, which should release new springs of energy among the people and make them participate actively. Small scale industries are essential to provide subsidiary or alternative occupations and to utilise local raw materials or cater to local markets."

The *Industrial Policy Resolution*, 1956, while emphasising the role of cottage and small scale industries stated :

“They provide immediate large-scale employment ; they offer a method of ensuring a more equitable distribution of the national income and they facilitate an effective mobilization of resources of capital and skill which might otherwise remain unutilised. Some of the problems that unplanned urbanization tends to create will be avoided by the establishment of small centres of industrial production all over the country”.

In the *Second Five Year Plan* it observed. “Village and small industries in their different aspects are an integral and continuing element both in the economic structure and in the scheme of national planning. The primary object to developing small-scale industries is to extend work opportunities, raise incomes and standard of living and bring about a more balanced and integrated rural economy. Inevitably, in rural areas, the traditional industries have to be given immediate consideration.”

The *Third Five Year Plan* remarked, “Village and small industries have made a significant contribution in the first two Plans in realising the objectives of expanded employment, larger production and more equitable distribution. With the larger dimensions of the tasks to be accomplished in the Third Plan, their role will be even more important.....The pace of technical change will have to be so regulated that large scale technological unemployment with consequent hardship and misery to millions of people is avoided. The problems of khadi and village industries, therefore, need to be constantly reviewed and necessary measures taken to realise the full potential of decentralised industry in the national economy.”

The *Fourth Five Year Plan* observed, “these industries provided part-time and fuller employment to about 8 million persons; and additional whole-time employment to about 6.3 lakh persons. During the Plan period, decentralised growth of industries would be promoted ; earning of the people engaged in such industries would be raised by improving their skills and productivity ; and organising artisans and craftsmen on co-operative lines.”

The *Fifth Plan* rightly mentions :

“A significantly large number of persons already dependent upon traditional industries like handloom, sericulture, coir, khadi and village industries are living below the poverty line....Therefore, the principal objectives of the programme for the development of different small industries in the Fifth Plan are to facilitate the attainment of some of the major tastes for the removal of poverty and inequality in consumption standards of these persons through creation of large scale opportunities for fuller and additional productive employment and improvement of their skills so as to improve their level of earning”.¹

1. *Draft Five Year Plan, 1974-79, Part II, p. 164.*

The *Janta Party Manifesto*, 1977, clearly stated that to ensure full employment and decentralisation of economic power, the country must "follow the Gandhian precept that whatever can be produced efficiently by decentralised industry should be so produced. There is room for heavy and large-scale industry but only where it is not possible to organise such production satisfactorily in the cottage and small scale sector".

According to the *Draft Five Year Plan* (1978-79). "The rapid and widespread development of small and cottage industries is one of the major objectives of the Plan as a part of the primary goals of reducing unemployment and underemployment in the country. The major components of the strategy of village and small scale industries are :¹

- (i) To generate opportunities for fuller and full time employment by (a) revitalising and developing the existing traditional and other small scale industries, and (b) promoting intensive development of new viable small industries;
- (ii) to raise the level of earnings of rural artisans, handloom weavers, craftsmen and others employed in these industries;
- (iii) to promote the growth of these industries in rural areas and small towns ; and
- (iv) to reduce progressively the role of subsidies by providing these selectively for credit and development of skills, designs and marketing.

Classification of Cottage Industries

The cottage industries may be classified into the following categories :—

(i) *Part-time rural cottage industries*, which cover all such industries which provide supplementary occupation to agriculturists and which are mostly agro-industrial in nature e.g. :—

- (a) *Processing industries*—processing of cereals and pulses, oil extraction, cotton ginning, coffee grinding, groundnut decortication, rice hulling, etc.
- (b) *Agro-based industries*—dairying, poultry, piggyery, bee-keeping, sheep and goat rearing, fish culture, sericulture, arboriculture, etc.
- (c) *Fruit and vegetable preservation and utilization*—bottling and canning of fruits, dehydration of peas, *chutney*, pickles, sauces, soaps, *sharbat* making.
- (d) *Handloom weaving*, hosiery and knitting.
- (e) Tadi, palm gur, jaggery, khandsari making; flour grinding, dal making, oilseed crushing, bakeries and confectionaries.
- (f) Basket and rope making, cane and wicker work, biri making etc.

1. *Draft Five Year Plan*, 1978—83. (1978), P. 177.

(ii) *Whole-time rural industries*, comprise mostly of village crafts like :—

- (a) pottery, clay toys, making of bricks and tiles, kitchen wares and earthen utensils, limestone making.
- (b) saw milling, wood work and carpentry, blacksmithy.
- (c) leather flaying, curing, tanning of hides and skins, making of foot-wear, collection and processing of bristles, animal casings, utilization of horns, hoof and bones, cattle carcass, etc.

(iii) *Urban cottage industries* generally provide whole-time occupation to the workers engaged in them, e.g. :—

- (a) gold and silver ornament making, brass and metal utensil making, trunk and suit-case, metal containers, and galvanized buckets making.
- (b) wood and ivory carving, card board boxes, pencil making, saw milling, furniture and joinery works.
- (c) fabric making, tailoring and ready-made garments, thread manufacture, hosiery and knitting.
- (d) toy making, sports goods, stationery goods, paper making.
- (e) aerated water and soft-drink.

Some Important Village Industries

Promotion and encouragement of co-operative efforts for the development of khadi and other village industries has been an important function of the khadi and village industries commission.

PROGRESS OF KHADI AND VILLAGE INDUSTRIES IN INDIA

Items	1955-56			(in Rs. Lakhs) 1970-71		
	Khadi	Village industries	Total	Khadi	Village industries	Total
Value of output	554	1,093	1,647	2,585	8,560	11,145
Employment (Nos. in lakhs)	6.58	3.01	9.59	9.41	9.79	19.20
Wages	332	360	692			
Percentage share of wages in output	59	33	52	55	17	25
Wages per head per annum	50	120	72	151	147	148
Per capita output per annum	84	363	172	275	874	580

(Source : *Khadi and Village Industries Commission : Activities At A Glance*, p. 7)

Khadi production was of the order of 3584 m. metres in 1968-69. It increased to 3830 m. metres in 1972-73. But in 1973-74 its production was 3650 m. metres. The production of all varieties (including woollen and silk cloth) increased from 53.76 m. metres in 1960-61 to 84.85 m. sq metres in 1965-69 but declined to 60.0 m. sq. metres in 1968-69 and increased to 72.2 m. sq. metres in 1972-73. It gives employment to about 90 lakh persons.

Gur and Khandsari

This industry has been organised by the Commission. The production of gur and khandsari increased from 123.0 thousand tonnes in 1960-61 to 248.8 thousand tonnes in 1965-66 but declined to 204.3 thousand tonnes in 1968-69. It was about 240.0 thousand tonnes in 1973-74.

The Commission has helped the industry by introducing and supplying improved implements (bullock-driven or power-driven crushers centrifugal and replacement of traditional *kolhus* by improved ones), giving an extraction of 65 to 68 per cent ; by introducing cheap juice clarificants and improvement of the quality of product ; by introducing sulphitation process which has increased the recovery of khand to about 75 per cent ; by organising gur production units ; by training cane growers in improved techniques of gur production ; and by constructing godowns for storing sugarcane and gur. It provides seasonal employment to about 30 lakh people.

Palm Gur Industry

There are about 80 m. palm trees in the country, of which 80 per cent are palmyra. But of this number, only about 50 m. are exploited. The industry gives direct employment to about 20 lakh people and indirect employment to about 6 lakh people for 200 days in a year. The Commission covers about 3 1/2 lakh tappers organised in about 3,300 co-operatives covering some 7,000 villages. The value of palm gur was Rs. 69.18 million in 1964-65, and Rs. 65.22 m. in 1968-69 and about Rs. 70 m. in 1973-74. The production amounted to 78.2 thousand tonnes in 1960-61 and 94.1 thousand tonnes in 1965-66. It was a little over 95 thousand tonnes in 1973-74.

Processing of Cereals and Pulses Industry

Hand pounding of paddy is an old industry. Owing to mechanisation, the production of hand pounded rice has been reduced from 75 per cent to about 40 per cent. The production was 57.7 thousand tonnes in 1960-61, it decreased to 42.0 thousand tonnes in 1965-66 and rose to 78.4 thousand tonnes in 1968-69 and to about 80.0 thousand tonnes in 1973-74. The industry provides full time employment to about 15,000 people ; and part time employment to about 40,000 people.

The development programme stated by the Commission consists of the manufacture and supply of improved implements, establish-

ment of marketing depots, construction of godowns for storage of rice, paddy and implements ; and provision of training to the artisans, at Wanakhori (Gujarat). Improved implements like dhenkis, atta chakies, ball-bearing sets and winnowing fans are distributed.

Village Oil Industry

A number of oilseeds are crushed both for edible and non-edible purposes. The production of edible oil was 59.6 thousand tonnes in 1960-61 ; it declined to 50.1 thousand tonnes in 1965-66 and 38.4 thousand tonnes in 1968-69, but was about 50 thousand tonnes in 1973-74.

Oil processing and crushing industry provides full time employment to about 30,000 people and part-time employment to about 15,000 people throughout 5,000 co-operatives which run about 45,000 ghanis.

The development programme of the Commission consists of the schemes of financial help to the oilmen for purchase of oilseed ; supply of improved ghanis and help in the sale of oil through registered selling agencies ; and the organisation of cooperative societies.

Non-edible oil and Soap

Important non-edible oilseeds available in the country are neem, mahua, karanja, pilu, pisa, maroti, ratanjoti, Kamla, and Kokum etc. This industry provides seasonal employment to about 95,000 people.

The Commission's programme emphasises on the preservation and conservation of non-edible oilseeds for strengthening the raw materials required by the vegetable oil-based industries.

Hand-made Paper

This type of paper is being made by city-wastes like rags, clothes, paper and rural-wastes like plant stalks, paddy straw and bagasses. The production of hand made paper increased from 1,227 tonnes in 1960-61 to 1,966 tonnes in 1965-66 and to 2,888 tonnes in 1968-69 and to about 3,000 tonnes in 1973-74. It provides employment to about 4,000 people.

With the improvements in techniques of rag cutting, pulp beating, calendering and glazing ; and the use of mechanically driven beaters, new types of paper such as stencil, tissue, decorative, packing and better varieties of paper are being produced.

Village Tanning Industry

There are about 900 flaying centres and over 700 tanneries. These produce leather goods and tan hides and skins. The production of leather goods was in terms of values, Rs. 0.36 crores in 1960-61. It increased to Rs. 2.69 crores in 1965-66 to 4.65 crores in 1968-69 ; and to over Rs. 5.00 crores in 1973-74.

Bee Keeping

This industry is mostly developed in south India. The Commission covers about 17,000 villages where there are over 250,000 bee colonies. The number of bee keepers is about 75,000. The production of honey rose from 562,000 kgs. in 1962-63 to 15,00,000 kgs. in 1968-69.

Village Pottery

The industry gives employment to about 5 lakh families of potters for nearly 8 months in a year. The annual value of potteries has been estimated at more than a crore of rupees.

The Commission covers about 30,000 potters. The development programmes consist of training and research, financial assistance, service facilities, provision of common workshop, brick-kilns and training-cum-production centres.

Sericulture

This industry is developed mostly in Karnatak state, which produces about 50 per cent of the total production followed by W. Bengal, Assam, Kashmir, M.P. and Bihar.

The total production increased from 1.9 m. kgs. in 1960-61 to 2.15 m.kgs. in 1965-66, to 2.35m. in 1968-69; to 2.8 m. kg. in 1973-74 and to 3.55 kg. m.in 1977-78. By 1982-83, it is expected to rise to 62 m. kgs.

The number of persons to whom sericulture provided part-time employment rose from 2.7 m. in 1960-61 to 3.0 m. in 1968-69 ; to over 3.2 m. in 1973-74. and to 3.6 m. in 1977-78. By 1982-83, the employment is expected to increase to 4.4 m. persons.

The value of exports of silk fabrics and waste increased from Rs. 1.37 crores in 1960 to Rs. 2.82 crores in 1965. Rs. 5.97 crores in 1968, to Rs. 9.2 crores in 1973 ; and to Rs. 27 crores in 1977-78. By 1982-83 it is expected to increase to Rs 60 lakhs.

The Central Silk Board, established in 1949, looks after the development of silk and sericulture industry.

Research centres work at Berhampore, Mysore, Ranchi ; and Seed Stations at Srinagar, Coonoor and Lokha.

Coir Industry

This industry is essentially export-oriented and is mainly organised on a cottage basis, though some factories employ wooden looms worked by manual labour. It is concentrated in Kerala. The production of coir fibre increased from 152,000 tonnes in 1960-61 to 161,000 tonnes in 1973 and that of coir products from 24,200 to 26,000 tonnes and coir rope from 14,250 tonnes to 21,000 tonnes.

The value of exports increased from Rs. 8.7 crores in 1960-61 to Rs. 11.10 crores in 1965-66; to Rs. 14.5 crores in 1968-69; to Rs. 15.5 crores in 1973-74 and to Rs. 25.0 crores in 1977-78. The industry provides employment to about lakh persons.

The Coir Board looks after the development of the Industry. Research Centres work at Alleppy and Uluberia. The National Coir Training and Design Centre trains peoples and evolves new and improved designs for coir products.

Handicrafts

These, including precious, semi-precious and synthetic stones, jewellery, carpets, druggets and other art crafts such as art metalware and hand printed textiles, engage about 14 lakh persons in about 4 lakh handicraft establishments. Their production increased from Rs. 253 crores in 1961 to Rs. 320 crores in 1973, to Rs. 440 crores in 1977-78. It is expected to increase to Rs. 800 crores by 1982-83. The exports increased from 19.34 crores in 1961 to Rs. 65 crores in 1973.

The All-India Handicrafts Board, set up in 1962, looks after the improvement in production and marketing of handicrafts. It also provides assistance in designing through its 5 regional offices: and provides training facilities through 6 pilot centres.

SMALL SCALE INDUSTRIES

As noted earlier, small scale industries are undertakings having investments in fixed assets in plants and machinery not exceeding Rs. 10 lakhs.

These industries may be classified into four types:

(i) *Part-time urban small scale industries*; consist mostly of seasonal industries engaging part-time labour, e. g., pottery, tiles and cement pipes, sanitary wares.

(ii) *Who'e-time urban small scale industries* include small perennial factories in urban areas, like: (a) biri and cigarette making (b) blacksmithy, carpentry, engineering units for servicing of factors, harvesters, threshers, ploughshares, duster and sprayer of insecticides; (c) electrical units for electrical installations, servicing electrical motors, pumping sets, tube-wells, grinder flours and dehussing mills, powerlooms; (d) hosiery plants, bobbins, furniture making, printing presses, roller skins; (e) handicrafts like *newar durrie*, and carpet making, embroidery, tailoring, soap, coir products, hair oils and perfumery; (f) metal based industries like galvanised buckets, boxes, brass utensils, wire products, builders' hard-ware small foundries and forge shops, welding, galvanising and electroplating; (g) dyeing, drugs and medicines, moulded plastic goods, fertilizers; (h) miscellaneous industries like umbrella assembling, cycle repairing, storage batteries, cycle parts, aerated water, soft drinks, confectionary, basket and cane work, goldsmithy, leather work.

(iii) *Part-time rural small scale industries* include all seasonal factories in rural areas primarily concerned with the processing of agricultural produce like rice, dal, gur making and flour mills.

(iv) *Whole-time rural small scale industries* are extremely few which suggests that it is in this field that scope for their setting up is the greatest.

Role of Small Scale Industries

Small scale industries play a significant role in national economy. In 1969-70, about 90 percent of the registered factories in India with about 35 percent of their total employment were small scale industries. The number of registered units has gone up from 36,199 in 1961 to 4.09 lakhs in 1974 ; and to 5.26 lakhs in 1976.

The total employment provided by these industries has risen from 27 lakhs in 1965 to 33 lakhs in 1970 to 45 lakhs in 1973 and to 55 lakhs in 1976.

The gross value of these industries rose from Rs. 2,374 crores in 1965 to Rs. 3,670 crores in 1970, to Rs. 4,050 crores in 1971, Rs. 6,249 crores in 1973 ; and Rs. 12,400 crores in 1976.

They constitute 90 per cent of the total registered factories and account for about 40 percent of the total production in the registered manufacturing sector.

The fixed capital involved was Rs. 814 crores

Over 500 items have been reserved for exclusive development in the small scale sector, as per new Industrial Policy of 1977.

Apart from the qualitative growth, there has been a significant increase in the variety of products manufactured by these units. Small scale sectors has ventured into many new and sophisticated fields of production which include TV set, cardiac pacemakers, ECG machines and hearing aids. They also supply parts and components to large scale industries engaged in the manufacture of machine tools, bicycles, automobiles, electrical appliances and machining.

Present Plight of Village and Small Scale Industries

Regarding village industries the Planning Commission has admitted that "the development of such industries is hampered by the present level of technology and by shortage of trained and experienced supervisory personnel..... While these industries have helped to provide partial relief to village artisans and under-employed women workers in the villages, they have not been able to provide fully remunerative work or to attract young men with same measure of training and education.¹

The *Fourth Five Year Plan* has indicated the principal lacunae and deficiencies of these industries thus : "(i) The coverage of these

1. *Third Five Year Plan*, pp. 196-197

industries under the development programmes is still rather limited (ii) Shortage of raw materials emerged as a serious retarding factor in the expansion of several industries ; (iii) Elements which contribute to the intrinsic strength of small industries, viz., the adoption of appropriate technology and of proper management methods have not always received sufficient attention ; (iv) Certain essential facilities, particularly research have not been organised on any sufficient scale for the small scale industries ; (v) The progress in building up ancillary industries have been slow ; (vi) Success in promoting industries in rural areas has been very limited ; (vii) the wage levels in traditional industries continue to be low and sustained in appreciable measures by subsidies, rebates, etc."

Problems of Cottage and Small Scale Industries

1. **Shortage of Raw materials.** The cottage worker suffers from *acute shortage of raw materials*. The handloom industry is wholly dependent upon the supply of yarn from cotton mills and hence the shortage of yarn is always felt. The tanners also complain that good quality hides are bought by rich middlemen on behalf of city firms and exported, and similarly good type of wool finds its way to cities and hence a serious shortage of these raw materials is often felt. They also pay comparatively high price for raw materials because of the middlemen. *Thus the artisan does not get enough of what he wants, what he gets is of poor quality and that too has to be bought at higher prices.* In addition, there is also a considerable lack of reliability in the quality of raw material sold by the middlemen with the result that it destroys the reputation of the artisan who uses them.

The result is that these industries very often fail to produce goods in requisite quantities of good quality and at cheap rates.

The future growth of these industries depends on access to raw materials and equipments. The International Team, therefore, recommended specific revision in the present system of allocations which redress the current inequalities of allocation and distribution between large and small industries. It suggested a phased programme toward a single price-tax system for all commodities.

Efficient marketing would depend upon the choice of articles to be produced, by exploring the potential demand of the rural areas and by converting it into effective demand and by gauging the demand of the urban areas as well. As far as possible the marketing organisation of small producers should be a co-operative society—which should handle supply as well as the marketing functions of the members. The marketing organisation should be conversant with the government purchase policy and the facilities offered by the various organisations.

2. **Lack of Credit and Finance.** The financial disability of small artisans is beyond doubt. His financial needs consist of the purchases of raw materials, working expenses and accommodation

between production and sale of the products. Their internal sources are quite inadequate. "This leads to instability of their profits which deters banks from giving insecured loans."¹ Their requirements are met by moneylenders or merchant dealers and village sahuḱars who usually charge high rates of interest. The total amount of loans granted to them by the commercial banks forms a very small part of the total loans to the industry.²

The Second International Team recommended that the concessional interest rates (as at present prevalent) should be replaced by rate more nearly related to those in the market, and individual borrowers should be charged the same rates. Earnest money deposits should bear interest. Hire-purchase finance is simple, self-securing and flexible method of giving financial assistance and has a wide scope for further expansion.

Further, at present most of the units are debarred from getting finance because of conventional notions about credit-worthiness, repayment schedules and overdues. Finance, therefore, is made available by the Apex Industrial Co-operative Banks, and even by the Central Co-operative Banks (which have surplus funds) provided reasonable guarantees for repayment are made either by the promoters or the Government. Nearly all governments have set up Agro-Industrial Corporations for financial as well as technical assistance. The establishment of the Industrial Development Bank under the Reserve Bank of India is also a right move. But it is felt that only an organisation like the Rural Industries Commission would be able to co-ordinate the work of all these agencies while seeking co-operation from Commercial and Urban Co-operative Banks.

3. Low Level of Technology and Skill. The development of the village and small scale industries is hampered by the present low level of technology and shortage of trained and experienced supervisory personnel. So that the methods and art of production technique, especially in handloom, village ghanis and tanning and pottery are even now antiquated.

The small scale industries are provided, at present technical advice and assistance by three sources—the Central Small Industries Organisation ; common facility workshop ; and the prototype-cum-production centres. But the facilities provided by these bodies are not sufficient and satisfactory.

Instead of providing too many services in too many locations there should be greater concentration of activity in major locations. Design work taken up should be much more carefully related to Indian market requirements and the ability of small industries to produce machines after they have been tested.

1. C. L. Mervin, *Financing of Small Corporation*, pp. 15-24.

2. *The Second Report of the International Team* p. 10.

If the small scale industries are to compete with big industries, they must keep pace with advanced technology. According to Dr. Gadgil, "The small size of industries must be compatible with efficient production and as low an investment as practicable. Technology may be evolved out of traditional techniques or derived from advanced techniques by modifications or adjustments or could even be newly created according to needs." According to Dr. Schumacher, the average capital cost for an industrial unit should be from Rs. 1,000 to Rs. 2,000 per person.

Skill formation in the rural areas may be promoted through the basic and multipurpose polytechnic schools, systematic mobile demonstrations, in plant training facilities and audiovisual displays in which the best technology that has been useful in pilot industrial projects should be imparted to the trainees.

Industrial Estates Only in Urban Areas. The scheme of industrial estates was adopted to take the industry to rural areas. But in reality, because of availability of power, water supply and transport, most of the estates have been established in the precincts of the towns. It is, therefore, necessary to establish these estates in rural areas. Each estate should consist of not more than three/four factories (looking to the capacity of the neighbourhood to support and find resources for the same). They should also have a community workshop, equipped with common service facilities for supply-cum-marketing work. If power is available, a few machines like the circular saw drilling machines, welding sets, blowers, etc. smaller sheds should be set up in individual villages, each to accommodate 5 to 10 artisans, to whom tools could be distributed at subsidised prices.

COTTAGE and SMALL SCALE INDUSTRIES UNDER THE PLANS

Since Independence the Govt's policy towards these industries has been helpful. The Industrial Policy of 1948 and 1956 have assigned a significant role to these industries in the overall programme of industrialisation. The Industrial Policy Resolution of 1956 states; "They provided immediate and permanent large-scale employment at relatively small capital cost, to meet a substantial part of the increased demand for consumer goods and simple producers goods, they offer a method of ensuring a more equitable distribution of the national income, they facilitate an effective mobilization of resources of capital and skill which might remain unutilised. Some of the problems that unplanned urbanization tends to create will be avoided by the establishment of small centres of industrial production all over the country.¹ They will also bring out integration of the development of these industries with the rural economy on the one hand and large large scale industry on the other."

1. Reiterated in the *Second Five Year Plan*, p. 47.

During the *First Five Year Plan* Rs. 43 crores were spent for development of cottage and small scale industries. During the Plan period two important steps were taken for the development and expansion of cottage and small scale industries. These were : (i) setting apart by the government of substantial finance for the development of these industries ; and (ii) the building up of a network of All-India Boards to deal with the problems of the handloom handicrafts, khadi and village industries, small-scale industries, sericulture and coir industry. Four regional small Industries Service Institutes were set up with a number of branch units for the purpose of providing technical services advice and assistance of small business. The Central Small Industries Organisation, for marketing of the products of small-scale industries was also set up.

During the *Second Plan*, the government wanted to implement as far as possible the basic recommendations of the Karve Committee regarding the avoidance of technological unemployment and attempted to provide as large a measure of increased employment as possible in traditional industries. During this Plan period about Rs. 175 crores were spent, as against a provision of Rs. 187 crores.

In course of this Plan period, Small-scale Service Institutes were set up in all states. In addition 42 Extension Centres were established in association with the village and small-scale industries in different parts of the country. About 60 Industrial Estates comprising 700 small factories, were set up, though in all 120 new Industrial Estates were sanctioned for the Plan period.

The Industrial Policy of 1956 emphasized that the State policy would be to ensure the village and small industries in the decentralised sector acquired sufficient vitality to be self-supporting that their development was co-ordinated with that of large-scale industries. The extension of rural electrification and the availability of cheap power at lower price in future were expected to help considerably towards the fulfilment of these objectives. In the meantime, the policy of protection to village and small-scale industries by means of restriction on the volume of production in the large-scale sector and by differential taxation or by direct subsidies was continued.

The main objectives kept in view in implementing programmes for village and small industries in the *Third Plan* were : (i) to improve the productivity of the worker and reduce production cost by placing relatively greater emphasis on positive forms of assistance such as improvement of skill, supply of technical advice, better equipment and credit, etc. (ii) to reduce progressively by the role of subsidies, sales rebates and sheltered markets : (iii) to promote the growth of industries in rural areas and small towns : (iv) to promote the development of small scale industries as ancillaries to large industries ; and (v) to organise artisans and craftsmen on co operative lines.

A total outlay of Rs. 264 crores was provided in the *Third Plan* ; the actual expenditure was of the order of Rs. 240.76 crores

During 1966-69, the expenditure was estimated at Rs. 132.55 crores. During the *Fourth Five Year Plan* period, the total provision fixed was Rs. 293.13 crores as against this, the estimated outlay worked out to be Rs. 251 crores. It was estimated that the development programmes for these industries would provide part-time or fuller employment to about 11 m. persons and whole-time employment to about 16 lakh persons, 250 new industrial estates would be set up. During the Fourth Plan period, the aims were ; (i) to promote decentralised growth of industries, (ii) to raise the earnings of those engaged in small industries by providing positive forms of assistance for improving their skills and productivity ; and (iii) to organise artisans and craftsmen on co-operative lines.

Under the Fifth Plan the principal objectives of the programme for the development of different industries were to facilitate the removal of poverty and create employment opportunities and improvement in the skills of the artisans. The broad strategy for the development of these industries was.¹

(i) To develop and promote entrepreneurship and provide a package of consultancy services so as to generate maximum opportunities for employment :

(ii) To facilitate fuller utilisation of the skills and equipment for persons already employed in different small scale industries ;

(iii) To progressively improve the production techniques of these industries so as to bring them to a viable level, and

(iv) To promote these industries in selected growth centres, in semiurban and urban areas including backward areas.

In the Fifth Plan, the provision was made for an allocation of Rs. 535.03 crores (Rs. 610 crores in the Draft Plan). The estimated expenditure during 1974-78 on the village and small scale industries aggregated to Rs. 388 crores.

Outlay on village and small Industries²

Industry	Fifth Plan Outlay (In crores of Rupees)	Estimated expenditure	Plan outlay 1978-83.
Handloom Industry	99.42	80.63	280.00
Powerlooms	3.25	1.53	6.00
Khadi and Rural Industries	142.98	126.38	390.00
Small Scale Industries	200.68	121.89	545.00

1. *Draft: Fifth Five Year Plan*, p. 164.

2. *Ibid.*, p. 179.

Industrial Estates	21.06	17.64	45.00
Handicrafts	29.80	14.94	57.00
Sericulture	29.68	19.23	70.00
Coir Industry	7.66	5.55	17.00
Total	535.03	387.79	1410.00

As a result of this outlay, the production of cloth in the decentralised sectors likely to increase to 41,00 million metres (2,300 m. metres from handlooms and 1,803 m. metres from powerlooms.) The production of small scale industries increased from Rs. 538 crores in 1974-75 to Rs. 1,000 crores in 1977-78.

Village and Small Scale Industries¹

Number	1965-66	1970-71	1974-75	1977-78 (78 likely)
A. Production				
1. Cotton cloth				
(i) Handlooms (m. metres)	3,056	2,280	2,290	2,300
(ii) Powerlooms (m. metres)		1,412	1,678	1,800
2. Khadi				
(i) Quantity (m. sq. metres)	85	57	59	72
(ii) Value (Rs. crores)	26.81	25.85	43.28	64.10
3. Village Industries (Rs. crores)	55.87	85.60	136.31	206.24
4. Raw silk (Lakh kgs.)	21.50	28.40	29.92	33.40
5. Small scale Industries (Value Rs. crores)	N.A.	N.A.	49.32	67.00
B. Exports				
1. Cotton handloom fabrics and manufactures (Rs. crores)	12.57	12.40	107.20	210.00
2. Silk fabrics and waste (Rs. crores)	2.82	14.23	12.66	27.00
3. Handicrafts (Rs. crores)	27.58	80.30	194.38	440.00
4. Coir Products				
(i) Quantity (000 tonnes)	74.23	52.21	42.00	45.00
(ii) Value (Rs. crores)	17.47	13.87	17.60	25.00
5. Small Scale Industries	N.A.	171.00	537.90	1,000.00
C. Growth of small scale Industries				
1. No. of regd. units (cumulative lakhs)	1.05	2.38	2.20	2.60

1. *Draft Five Year Plan, 1978-83*, p. 182.

Till the Fifth Plan, the programmes for the development of these industries consisted mainly of certain fiscal measures and a number of schemes for providing assistance and facilities in different forms, without a careful assessment of their appropriateness and viability. The Draft Five Year Plan has observed, "Fuller and additional full-time employment generated in most traditional rural industries was not upto expectations.....By and large, the objectives of the various programmes of improving the skills and production techniques, development of ancillary industries, growth of industries in rural and semi-urban areas and improvement in the levels of income, have not been achieved to an appreciable extent in a number of these industries. Common production programmes were not formulated in detail. There was also an increase in the number of schemes, agencies and institutions, without adequate arrangements for co-ordination and monitoring of their activities. Most of the artisans, craftsmen and other small entrepreneurs failed to get a package of assistance and services, specially scarce raw materials. The small scale units have come up largely in cities and large towns. The incidence of sickness in this sector increased due mainly to deficiency in management, delayed payments by buyers, inadequacy of finance and marketing outlet."

In this background, the Draft Five Year Plan, therefore, proposed to formulate development programmes for some selected (i) industries based on in-depth studies of their present position, potential and problems ; and (ii) 'growth' areas based on detailed inventories of the existing and potential resources of blocks and districts to be selected for integrated rural development including tribal, hill and other backward areas. By concentrating on a smaller number of carefully chosen industries and areas, the pitfalls of the approach adopted so far will be avoided.

The levels of employment and production anticipated in 1982-83 are indicated below :

Employment and Production-Village and Small Industries

	Employment (Lakh person)		Production	
	1977-78	1982-83	1977-78	1982-83
Industry	(Likely)	(Anticipated)	(Likely)	(Anticipated)
1. Handloom Industry	57.10	92.00	2,300	3,700 (m. metres)
2. Powerlooms	10.00	13.00	2,900	3,900 (m. metres)
3. Khadi and Rural Industries	25.60	74.48	270	2,561 (Cr. Rupees)

4. Small scale Industries	27.68	57.68	6,700	267,000 (Rs. crores)
5. Industrial Estates				
6. Handicrafts	18.20	24.00	550	800 (Rs. crores)
7. Sericulture	36.00	44.00	35.4	62.5 (Rs. crores)
8. Coir Industry	5.00	5.00	N.A.	N.A.

GOVERNMENT POLICY MEASURES

The government has so far adopted many measures for the development of cottage and small scale industries. It has set up a number of agencies to help these industries. These include small scale Industries Board, the Khadi and Village Industries Commission, the All-India Handicrafts Board, the All-India Handloom Board, the Coir Board and the Central Silk Board.

To encourage the small sector, the Central Government initially reserved 180 items for exclusive production in the sector. This list has now been enlarged to contain more than 500 items.

To provide institutional credit to this sector, financial assistance is available from the State Governments, S. F. C. and banking institutions. Scheduled commercial banks extended credit to 3.97 lakh units during 1976-77. The credit guarantee scheme, modified in 1970, is now being availed of by 211 credit institutions.

The import policy for raw materials for this sector has been liberalised in 1976. Units getting licenses upto Rs. 50,000 now get licenses automatically without showing any consumption. They also obtain these licences upto Rs. 50,000 in free foreign exchange.

Technical advice and assistance to small-scale manufacturers is provided by small Industries Development Organisation through its network of 16 Service Institutes, 27 Branch Institutes, 41 extension and 7 Production and Training Centres. The organisation also provides common service and tool room facilities in workshops attached to small industries, service institutes and extension centres. It conducts courses in management and technical disciplines.

The National Small Industries Corporation set up in 1955, operates the scheme of producing machinery for small-scale manufacturers on a hire purchase basis on concessional terms.

Legislative protection to cottage and household industries to ensure that these activities, which provide self-employment in large numbers get due recognition in the industrial development of the country.

District Industries Centres

The Industrial Policy Resolution of 1977 mentions the setting up of district industrial centres as focal points for transfer of technology to marketing and allied fields. In each district, there will be one agency to deal with all requirements of small and village industries. These requirements will include economic investigation of the districts' raw materials and other resources, arrangements for credit facilities, supply of machinery and equipment, provision of raw materials and other resources, an effective set up for marketing and a cell for quality control research and extension.

The broad objectives of such a centre would be :

- (1) to set up display and information cells ;
- (2) to show levels of technology used in rural industries ;
- (3) to establish design and development facilities for re-scaling of technology for transfer ;
- (4) to establish quality control services for small and cottage industries ;
- (5) to hold regional trade fairs, spot lighting development of technology in selected industries ;
- (6) to arrange buyer and seller meets on technology ;
- (7) to provide panorama of available technology for diffusion within the country ;
- (8) to provide techno-economic services to the entrepreneurs under one roof.

Agriculture under the Sixth Plan

Since agriculture has been the main stay of the people, for it provides not only the food grains and other commercial crops but also employment to millions of farmers and others in agricultural operations and allied occupations. Fittingly greater emphasis has been placed on an integrated approach to agricultural development through pest control, nutrient and energy supply and to production conservation consumption and trade. The main strategy of this development comprise three-fold measures :

- (a) To fight the triple alliance of weeds, pests and gives through an appropriate blend of genetic, agronomic, biological and chemical methods of pest control.
- (b) To harness fully the organic and biological sarchese of fertilisers for increasing their supply to land under cultivation.
- (c) To look after the health of the soil, the plant and animal life, through community help.

According to the Sixth Plan Document, the three major factors influencing stability of production are weather, pest epidemics and public policies. Weather aberrations are beyond human control. But contingency plans will have to be prepared for areas prone to drought and floods so that weather hazards could be minimised. Pest epidemics can be kept under control through proper pest surveillance and plant protection measures. Public policies in the area of agrarian reforms and pricing, marketing and distribution can be tailored to stimulate production. The Sixth Plan therefore, puts greater stress on minimising the handicaps of small and marginal farmers and maximising the benefits for intensive agriculture offered by small holdings. A three-pronged strategy has been envisaged for this propose :

- (i) Improving the productivity and income from small holdings through detailed advice on land and water use based upon 4 criteria, (a) *ecological integration* in land use pattern to help avoid the problems of water logging saturation, erosion, etc irrigated areas; and to elevate and stabilise production in un-irrigated areas through water, harvesting and conservation;

- (b) economic land use so that costs, and risks are reduced and returns increased through proper advice on marketing ;
- (c) optimum use of available forms of energy; and (c) optimisation of employment opportunities.
- (ii) Promoting farmers organisations for storage and marketing particularly of perishable commodities, to protect them from exploitation by middlemen.
- (iii) Diversification of opportunities for income through the introduction of subsidiary occupations under different Rural Development Programmes.

Objectives and Strategy of Agricultural Programmes

The aims of the agricultural programmes have been laid down thus :

- (a) to consolidate the gains already achieved ;
- (b) to accelerate the pace of implementation of land reforms and institution building for beneficiaries.
- (c) to extend the benefits of new technology to more farmers, cropping systems and regions and to promote greater farm management through concurrent attention to cash and non-cash inputs;
- (d) to make agricultural growth not only instrument of maintaining an effective national food security system but also a catalyst of income and employment generation in rural areas ;
- (e) to promote scientific land water use pattern based on considerations of ecology, economics, energy conservation and employment generation; and
- (f) to safeguard the interests of both producers and consumers by attending to the needs of production conservation, marketing and distribution in an integrated manner.

To achieve these objectives the Planning Commission postulates the following pre-requisites so that maximum benefit could go to the small and marginal farmers :

- (a) Extend the benefits envisaged under the Integrated Rural Development Programme to all farming communities in all the blocks:
- (b) Help to organise farmers Agro-service Centres for providing relevant services in the area of tillage and farm operations, water conservation and management, plant protection, processing and marketing;

- (c) Promote group management of soil, plant and animal health care without affecting the individuality of farm holdings;
- (d) Organise effective input supply services including credit;
- (e) Provide necessary assistance in the areas of post-harvest technology particularly with regard to marketing through the rural godowns project; and
- (f) Develop further on-going crop/animal credit insurance schemes to insulate farmers from losses due to reasons beyond their control.

The main objective through the Plan period would be to minimise variations in per capita income and regional imbalances in different parts of the country through : (i) strengthening of the research work in relatively less developed areas; (ii) introducing "training and visit system" of extension; (iii) restoring the damage done to land due to all man-made processes which either destroy or diminish the biological potential of land; (iv) providing opportunities for remunerative marketing of the farmers crops; (v) introducing corrective measures and popularising the cultivation of pulses, oilseeds and develop "pulses and oilseed crops villages;" (vi) protecting plant and producing and distributing quality seed; (vii) building a National Food Security System—with a minimum grain reserve of 15 million tonnes; and minimising the losses in storage through an intensification of the "Save Grain Campaign"; and (viii) stabilising prices of agricultural commodities by increasing their production.

Programmes for Agricultural Production

Agricultural production programmes have been formulated on the basis that stable agriculture could be possible by (i) increasing irrigation potential ; (ii) increasing use of fertilizers and pesticides; (iii) better crop varieties and quality seeds ; and (iv) higher level of production technology for major cereals, cotton, sugarcane etc. Therefore, the main strategy for crop production during the Sixth Plan period would be on the following lines :

- (a) a steady growth of foodgrains (from 128 m. tonnes to 154 m. tonnes) to meeting the growing needs and a substantial increase in pulse production (from 11.6 m. tonnes to 14.5 m. tonnes) to improve the nutritional quality of the diet of the people ;
- (b) to aim at self-sufficiency in oil seeds production (from 9.32 m. tonnes to about 11.10 m. tonnes) to eliminate import of edible oil ; and
- (c) to increase production of export oriented crops like tea (from 564 m. kg. to 705 m. kg.) ; coffee (from 118,000

tonnes to 159000 tonnes), tobacco (from 465 m. kg. to 525 m. kg.) ; cashewnuts (from 180,000 tonnes to 300,000 tonnes); pepper (from 26,100 to 40,000 tonnes); chillies (637,900 to 700,000 tonnes), Jute (from 5.66 m. bales to 6.96 m. bales) ; cotton (from 7.34 m. bales to 9.20 m. bales) ; and sugarcane (from 175.80 m. tonnes to 215.00 m. tonnes) ; and fruits and vegetables :

Targets of Crop-Production, 1980-85

Crop	Base level 1979-80	Plan Target 1980-85
1. Foodgrains (million tonnes)		
Rice	51.24	63.00
Jowar	10.88	12.00
Bajra	5.28	5.80
Maize	6.23	6.80
Ragi	2.85	2.70
Small Millets	1.83	1.90
Wheat	35.64	44.00
Barley	2.30	2.90
<i>Total cereals</i>	116.25	139.10
Pulses	11.61	14.50
<i>Total foodgrains</i>	127.86	153.60
2. Oilseeds (million tonnes)		
Groundnut	6.12	7.30
Castor seed	0.24	0.30
Rope and mustard	1.91	2.40
Sesamum	0.49	0.55
Linseed	0.56	0.55
<i>Total 5 oilseeds</i>	9.32	11.10
Nigerseed	0.10	0.20
Safflower	0.23	0.35
Soyabean	0.40	1.00
Sunflower	0.15	0.35
<i>Total All oilseeds</i>	10.20	13.00
3. Sugarcane (m. tonnes)	175.80	215.00

4. Cotton (m. bales of 170 kg. each)	7.34	9.20
5. Jute (m. bales of 180 kg. each)	5.66	6.96
6. Mesta (—do—)	1.88	2.12
<i>Total jute & mesta</i>	<i>7.54</i>	<i>9.08</i>
<hr/>		
7. Tobacco (m. kg.)	465	525
8. Cashewnut (000 tonnes)	180	300
9. Coconut (m. nuts)	6,000	6,750
10. Arecanut (000 tonnes)	166	175
11. Tea (m. kg.)	564	705
12. Coffee (000 tonnes)	118	159
13. Rubber (000 tonnes)	144	200
14. Cardamom (000 tonnes)	4,500	5,500
15. Fruits (additional production)	—	2.5 m. tonnes
16. Vegetables (—do—)	—	4.0 m. tonnes

Efforts will be made increase production through increasing irrigation facilities ; maximising the area under high-yielding varieties; use of fertilizers and improved seeds, adoption of plant protection measures and remunerative price policies for the produce.

Animal Husbandary and Dairying

Live stock production and dairying programmes have been given importance as an instrument to bring about social change through supplementing the income and providing employment to worker sections of the people in the rural areas. The programmes envisage :

- (i) Increased production of feed and feeder and their integration into mixed farming systems, crop rotation and agro-forestry programmes. These programmes would be developed particularly in the drought prone and desert areas, tribal areas etc.
- (ii) Preservation and rehabilitation of species of animals like camels and yaks and undertaking cattle and buffalo development programmes by producing cows of indigenous breeds, crossbred cows and unproved buffalos. At least 10 million covers would be brought under cross-breeding programme so as to raise their number from 3 million to 8 million and introduce the use of frozen semen technology for artificial insemination in cows and she-buffaloes.

- (iii) Intensification of Research and development for evolving high yielding strains of ducks and hens. The teroiler chicks will be increased to 35 million.
- (iv) Implementation of intensive cross-breeding programmes with suitable exotic fine or medium wool breads through the establishment of large scale sheep-breeding farms. For mutton production more cross-breeds like corriedale will be raised.
- (v) For supply of adequate feed and fodder, high yielding varieties of fodder crops will be undertaken along with crop rotations.
- (vi) Increase in the coverage of insurance of live stock and poultry.
- (vii) The Operation Flood II would be extended to states, which have not been covered so far by this programme. This programme would be providing employment to about 10 million rural families. Under the programme, a national milk grid would be developed to cater to the milk supply of fair metropolitan cities and towns with one lakh and above population. Milk processing and marketing facilities would be created for 4.36 million litres per day in 4 cities and feeder balancing facilities in the rural areas for 20 million litres a day through the cluster federations.

Against the base level production of 3,000 million tonnes of milk in 1979-80, by 1984-85 the milk production would be increased to 38.00 million tonnes ; that of eggs from 12,320 million to 16,300 and that of wool from 34 million kgs. to 39 million kgs. during the Sixth Plan period. During the Fifth Plan (1973-74 to 1977-78), the production of milk increased from 23.20 million tonnes to 27.60 million tonnes, eggs 7700 millions to 10,280 million and wool 30.10 million kgs. to 31.80 million kgs. veterinary hospitals from 9,495 to 11,395 ; liquid milk plants from 90 to 127.

Fishries Development

During the Sixth Plan, the objectives of fishries development programme will be :

- (i) to step up considerably fish production both in marine (from 14.81 lakh tonnes to 22.00 lakh tonnes) and inland sectors (from 8.55 lakh tonnes to 13.00 lakh tonnes) i.e., the total fish production is to increase from 23.36 lakh tonnes to 35.00 lakh tonnes ;
- (ii) to promote inland fish production on scientific basis through extension, education, training and provision of

inputs with a view to increasing the productivity of water areas ;

- (iii) to organise intensive surveys on marine fishery resources assessment and ensure optimum exploitation of these resources through a judicious mix of traditional country boats, operators of mechanised boats and deep sea fishing vessels. The number of mechanised boats is expected to increase from 16,100 to 19000 and that of the deep sea fishing vessels from 105 to 350 ;
- (iv) to intensify efforts an processing, storage and transportation of fish, improve marketing, tap vast potential for export of fish and fish products ;
- (v) to increase the nursery area from 1,454 hectares to 2,800 hectares and the production of fry from 108 million to 2200 million.
- (iv) improve the socio-economic condition of fisherman.

Forestry Programmes

As a result of the Programmes of *Social Forestry* and economic and industrial plantations, 22 lakh hectares were planted with such plantations and another 14.8 lakh hectares with quick-growing species. Under the Six Plan, the main objective of the forest programme has been envisaged as :

- (i) Conserving the existing forests and launching of country-wide afforestation and social forestry programmes (i.e. mixed plantation of waste lands and reforestation of degraded forests and raising of shelter belts) ;
- (ii) to fulfil three needs : ecological security, fuel, fodder and other domestic needs of the population ; and the needs of village, small scale and large scale industries.
- (iii) To thrust the promotion of people's forestry movement in the form of (a) "Tree for Every Child Programme" for planting of trees of horticultural, floricultural, and final value ; (b) "Eco-Development Force", to restore damages of hill eco-systems through afforestation, and soil conservation ; (c) Agro-Forestry Programmes to undertake research in land management.
- (iv) to raise plantations of industrial and economic value.

Dry Farming Programmes

Under this programme emphasis has been laid on two aspects, viz. :

- (a) increasing agricultural production on dry land/rain-fed arable lands. The programme will cover areas with annual rainfall of 750 to 1125 mm. ; and
- (b) A programme of propagation of water-harvesting technology in medium-rainfall areas to conserve available moisture and utilise it for supplementary irrigation. The run-off of water collected into farm ponds, brenchdies can be used for (i) saving standing kharif crop from drought effect; (ii) providing pre-sowing irrigation for rabi crops ; (iii) extending the growing season for the benefit of long duration crops like castor, red gram, etc. ; (iv) providing a minimal irrigation for vegetables, fruits or fodder in small areas.

Soil and Water Conservation Programmes

- (i) Under soil and water conservation programmes, an additional 7.1 million hectares would be covered on the base of 23.4 million hectares.
- (ii) Centrally sponsored schemes of soil conservation in the catchments of River Volley Projects (which cover 21 catchments) will be extended to cover 3 lakh hectares.
- (iii) Integrated watershed management schemes in the catchments of 8 flood-prone rivers of the Indo-Gangetic Basin will be taken for controlling the flow of flood water downstream.

Utilisation of Organic Manures

The Plan estimates that about 1000 million tonnes of organic wastes in the form of crop residues and another 300 to 400 million tonnes of cattle dung and animal dropping are available annually. These materials contain approximately 6 million tonnes of nitrogen, 2.5 million tonnes of phosphate and 4.5 million tonnes of potassium. It is further estimated that from the rural wastes, 50 million tonnes of rural compost and another 15 million tonnes of urban compost could be prepared. Therefore, efforts would be made under the Sixth Plan to utilise the waste to the maximum possible extent. This would help in improving the dynamic equilibrium in soil-pant animal relationship.

Biogas Development

The Plan also estimates that about 300 to 400 million tonnes of animal excreta is available as base for biogas production, besides large quantities of plant residues and other organic wastes which could be mixed with the animal excreta for biogas production, to be used as a source of energy. If all these materials are utilised about 70,000 million cubic metres of methane gas (equivalent to about 160 million tonnes of fuelwood) could be produced.

Efforts will, therefore, be made to under a massive biogas development programme to set up about are million family size plants (from 70,000 such plants at present) and 100 community plants during the Sixth Plan.

Inputs and Services

Since agricultural production requires a variety of inputs and services for maintaining and expanding production—fertilizers and measures, improved seeds, plant production measures, and modern implements and machinery. The targets with regard to these are given below:

Targets of Inputs

<i>Item</i>	<i>Unit</i>	<i>1979-80</i>	<i>Plan Target (1984-85)</i>
<i>I. Seeds</i>			
1. Certified	Lakh Qutls.	13.71	54.00
2. Foundation	„	0.92	3.00
3. Breeder	„	0.06	0.12
<i>II. Fertilizer Consumption</i>			
1. Nitrogeaneous (N)	Lakh tonnes	35.00	60.00
2. Phosphatic (P)	„	11.50	23.40
3. Potassic (K)	„	6.10	13.10
Total N + P + K	„	52.60	96.50
<i>III. Pesticides</i>			
	Thousand Tonnes	60.00	80.00
<i>IV. H Y P Programme</i>			
	million hectares		
1. Paddy	„	13.60	25.00
2. Wheat	„	13.50	19.00
3. Maize	„	2.00	2.00
4. Jawar	„	3.00	5.00
5. Bajra	„	3.10	5.00
Total H Y P	„	35.20	56.00
<i>V. Gross Cropped area</i>			
	million hectares	171.00	181.00

VI. Irrigation

1. Minor Irrigation	million hectares		
(a) Surface water	„	8.00	9.00
(b) Ground water	„	22.00	29.00
Total	„	30.00	38.00
2. Major & medium	„	22.60	28.20
Total Irrigation	„	52.60	66.20

VII. Command Area Development

1. Construction of field channels	million hectares	3.10	7.10
2. Land levelling & shaping	„	1.00	2.00

Regarding *fertilisers and manures*, the Sixth Plan envisages an equitable and efficient distribution of fertilizers, and reduce regional imbalances in further consumption, and conservation and use of all organic waste and biological sources of nitrogen fixation and supply.

In regard to *improved seeds*, the area under high yielding varieties will be increased from 35.20 million hectares to 56.00 million hectares. National Seeds Projects shall be introduced on a larger scale. Certified seeds of important cereals oilseeds and vegetables will be increasingly produced by the State Farms Corporation of India.

The policy regarding *plant protection* measures relate to (a) minimising of losses arising out of pests and diseases ; (b) extending the area under plant protection from 80 million hectares to 100 million hectares ; (c) increasing consumption of pesticides from 60,000 tonnes to 80,000 tonnes ; (d) strengthening surveillance against pests and diseases in tribal areas ; (e) strengthening quality control arrangements ; (f) expanding the work on "Integrated Pests control" and intensifying the control of pests by biological means ; and (g) continuing the Scheme of "Control and Eradication of Pests and Diseases of Agricultural Importance including Weed Control in Endemic Areas."

In regard to provision of *implements and machinery*, the Sixth Plan aims at (i) introducing and popularising selected implements, particularly those which benefit the small and marginal farmers ; (ii) strengthening of the supporting services and infrastructure for demonstration and popularisation ; (iii) testing and quality control ;

(iv) training, and (v) promotion of agro industries and agro-survices centres 500 Farmers Agro-Service Centres...could be set up for training and assistance to entrepreneurs, groups of farmers and personnels of cooperating, etc. through adopting a multi-agency approach.

Irrigation Development Programmes

The Plan has rightly stated that "Irrigation Contributes substantially to the agricultural price stability, by removing to a large extent the elements of uncertainty in the agricultural production. Therefore, expansion in irrigation would be envisaged as a first priority in agricultural development."

The strategy aimed at in the Sixth Plan is :

- (i) Expeditions completion of as many on going major and medium schemes as technically and financially flisable.
- (ii) Initiation of selected projects to meet the needs of drought prove, tribal and backward areas to remove, regional imbalances in irrigation facilities.
- (iii) Taking up work of modernisation of old irrigation systems, in a phased manner, to meet the irrigation requirements of cropping patterns newly developed.
- (iv) Optimisation of benefits through better operation of existing systems and conjunctive use of surface and ground waters and adoption of Warabandi.
- (v) Efficient water management and introduction of Warabandi an rotational distribution system on the existing and new projects and formulation and monitoring irrigation programmes for different regions in a water year.
- (vi) Strengthening of Command Area Development Organisation.
- (vii) Ensuring adequate maintenance of the canals and distribution systems by making adequate financial allocations for maintenance of systems.
- (viii) Initiating investigation for a National Plan for inter-basin transfer of water from the water surplus area to the water short areas.

An outlay of Rs. 8448.36 crores is provided for major and medium irrigation works and Rs. 2800.13 crores on minor workers. With this outlay an additional irrigation potential of 5.7 million hectares under major and medium irrigation works and 8.00 million hectares by minor irrigation works.

Irrigation Potential & Utilisation 1950-80 and 1984-85

Item	ultimate irrigation Potential	1950-51 Pot. Util.		1977-78 Pot. Util.		1979-80 Pot. Util.		1984-85 Addition Target
	(In millions of hectares)							
1. Surface water	73.5	16.1	16.1	32.3	28.7	34.6	30.6	13.7
(a) major & medium	58.5	9.7	9.7	24.8	21.2	26.6	22.6	5.7
(b) minor	15.0	6.4	6.4	7.5	7.5	8.0	8.0	8.0
2. Ground water	40.0	6.5	6.5	19.8	19.8	22.0	22.0	7.0
Total	113.5	22.6	22.6	52.1	48.5	56.6	52.6	20.7

Under minor irrigation the physical achievements of save of the important items have been targeted as below :

Items	1979-80 (In 000)	1984-85
1. Dug wells	7,780	12 lakhs
2. Private tube wells	2,110	12 lakhs
3. Deep tube wells	36	15,000 (No)
4. Electrical pump sets	3,950	25 lakhs

Flood Control Measures

For flood control since the First Plan to 1980, an investment of Rs. 970 crores was made. This provided protection from floods to 11 million hectares. Since the damage from floods has been very high (Rs. 3128 crores during 1974-78 against Rs. 3104 crores during 1954-74), during the Sixth Plan, is it proposed to provide reasonable flood protection for 4 million hectares.

This will be achieved through :

- Completion of continuing major flood control works ;
- Extending the flood forecasting network to cover other Inter-State rivers, so far not covered by the Central Water Commission.
- Preparation of Master Plans, including construction of embankments, improvement of drainage channels in the flood affected areas, construction of storage reservoirs in the upper catchments and appropriate reservoir regulation to regulate the flood discharges.
- Adoption of soil conservation and afforestation programmes on watershed basis in the catchment areas of rivers causing flood.

- (e) Checking sea-erosion in Kerala and other coastal states
- (f) Maintenance of the existing flood control works.

Command Area Development & Water Management

By, March 1980, 76 C. A. D. schemes were in operation covering 15.3 million hectares of land in 16 states (as against 38 during 1974-78, covering 12.4 million hectares in 13 states). During the Sixth Plan, the coverage of CAD is proposed to be extended to more projects. For this following programmes will be taken up :

- (i) Intensification of the modernisation of irrigation systems.
- (ii) High priority to be given to drainage, and other on farm development works.
- (iii) Construction of field channels and water courses to carry water to individual fields.
- (iv) Levelling and shaping of land, including consolidation of holdings, realignment of field boundaries.
- (v) Lining of field channels and water causes.
- (vi) Exploitation of ground water through tube-wells, open wells, etc.
- (vii) Adoption and enforcement of a suitable cropping pattern.
- (viii) Development of marketing and processing facilities, animal husbandry and farm forestry.
- (ix) Preparation of plan of input supply for credit, seeds, fertilizers, pesticides, etc.
- (x) Determining the best package of practices for different crops in different agro-climatic conditions.
- (xi) Proper operation of irrigation system and timely scheduling of irrigation sufficient of Warabandi with farmer's participation and adequate legal and administrative backing.

Crop Insurance

Crop insurance scheme, based on area approach and covering the loss of production due to drought, excessive rain, flood, frost, hail, snow, windstorm, cyclone, insect infestations, plant diseases and any other unavoidable causes of losses due to adverse weather conditions—is to extended to other States, besides West Bengal, Tamil Nadu and Gujarat where the scheme is in operation since 1979.

Agricultural Credit

The main objectives of the institutional credit policy under the Sixth Plan are to :

- (a) secure an increase in the total volume of institutional credit for agriculture and rural development. Institutional credit is to be expanded from Rs. 2550 crores in 1979-80 to Rs. 5415 crores in 1984-85.
- (b) direct a larger share of credit to the weaker section, i. e., atleast 50 per cent of the institution will go to the weaker sections ;
- (c) reduce the regional imbalances in the availability of credit, by opening of more rural branches in under banked areas and establish Regional Rural Banks (to increase from 65 to 170) in 405 districts (from 270 in 1979-80) ;
- (d) bring about greater coordination between different credit institutions under the multi-agency system for which a National Bank for Agricultural and Rural Development will be established ; and
- (e) improve the recovery of institutional loans to ensure continuous re-cycling of credit;

Targets of agricultural credit by different agencies have been put as below :

Agency	Anticipated Advances in 1979-80	Level to be reached in 1984-85
<i>Cooperative</i>		
Short-term	1,300	2,500
Medium-term	125	240
Long-term	275	555
<i>Commercial Banks</i>		
[including RRBS]		
Short-term	450	1,500
Term Loans	400	620
Total	2,250	5,415

Cooperation

Evaluating the working of the Cooperatives, the Sixth Plan has observed.

"The progress of cooperatives over the years presents a mixed picture. There has been much progress quantitatively and yet there are a number of indicators which point to various lacunae in their development. The Cooperatively weak states (particularly in the Eastern Region) do not seem to

have made up any of their lag. In fact, some of the so-called Cooperatively advanced States have also slid down particularly in the field of credit due to mounting overdues. Nearly 37% of the total primary marketing Cooperatives are not doing any business and are virtually defunct...The Cooperative share of fertiliser sales has come down from 55% to 43%. Sluggishness in credit development due to heavy overdues in large number of States has eroded the overall viability of primary Cooperatives and has thus affected all other fields of activity like marketing of agricultural produce, farm inputs and consumer goods. The most outstanding of the deficiencies is in the area of management."

In the light of these problems and constraints attention will be paid to the following aspects during the Sixth Plan period :

- (a) Primary village societies would be strengthened to enable them to effectively act as multipurpose units catering to the diverse need of their members.
- (b) The existing Cooperative policies and procedures would be reexamined with a view to ensuring that the efforts of the Cooperative are more systematically directed towards ameliorating the economic conditions of the rural poor.
- (c) The role of the Cooperative federal organisation will be reoriented and consolidated so that through their constituent units they could effectively support a rapidly diversifying and expanding agricultural sector.
- (d) Professional manpower and appropriate professional cadres would be developed to man managerial positions.
- (e) Dairy Cooperative would be developed and strengthened in the context of Operation flood II. So also the fisheries Cooperative would be developed.
- (f) Increasing & role would be assigned to Cooperatives in the public distribution system and in the supply of essential consumer articles in the rural and urban areas.
- (g) Storage capacity of the Cooperatives and processing capacity of the oilseeds would be increased.
- (h) The Cooperative training and education programme would be intensified and increasingly limited to the growing and diversified needs of the various sector of Cooperative movement.

Targets for Cooperative Operations

Physical Programmes	Unit	Anticipated achievement in 1979-80	Level in 1984-85
1. Short term	Rs. Crores	1,300	2,500
2. medium term	"	125	240
3. Long term	"	275	555
4. Value of agricultural produce to be marketed through Coops.	"	1,750	2,500
5. Fertilizer to be distributed through Coops.			
(a) Quantity	Lakh tonnes (NPK)	23.50	45.00
(b) Value	Rs. crores	900	1,600
6. Value of Consumer goods to be distributed through coops in rural areas	"	800	2,000
7. —do—in urban areas	"	800	1,600
8. Construction of additional godowns			
(a) Rural godowns No. capacity	Lakh tonnes	22,000 22	52,000 44
(b) Marketing godowns No. capacity	Lakh tonnes	5,040 25	7,500 38
(c) Total storage capacity	"	47	82
9. Construction of Cold Storage No. Installed capacity.	Lakh tonnes	125 2.14	276 7.48
10. Processing Units installed			
(i) Sugar factories		142	185
(ii) Spinning mills		62	90
(iii) Oil units		304	390
(iv) Others		1,529	1,694
Total		2,037	2359

TABLE 1
Damage from Floods

Area affected (lakh h.a.)	Population affected (lakh)	Damage to crop area (lakh h.a.) (Rs. crore)	Damage to houses (lakh h.a.) (Rs. crore)	Cattle lost (lakh h.a.) (Rs. crore)	Human beings lost (lakh h.a.) (Rs. crore)	Damage to public utilities (lakh h.a.) (Rs. crore)	Total damage Cols. (4)+(6) +(7) (Rs. crore)		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
1971	133	507	62	423	2428	80	13	129	632
1972	57	272	24	99	897	12	59	47	158
1973	137	636	76	428	870	53	261	88	569
1974	67	294	33	412	747	72	17	85	569
1975	62	314	39	271	794	34	17	166	471
1976	179	505	77	595	1746	92	80	202	889
1977	174	495	83	667	1667	152	556	329	1202
1978	186	705	100	911	3507	168	239	376	1455
1979	40	195	22	170	1329	210	618	234	614
1980	114	541	56	366	2531	171	59	293	830
Annual average									
1953 to 1960	70	164	22	46	608	12	44	7	64
1961 to 1970	59	178	27	89	628	17	51	20	126
1971 to 1980	115	446	57	440	1652	104	192	195	739

Note : Value of damage at current prices.

Source : Derived from data published by Central Water Commission.

TABLE 2
Cost of Damage from Floods in Leading Flood-Prone States

(Rs. crore)

	1980	1979	1978	1977	1976
1. Andhra Pradesh					
Crop-damage	9	21	54	352	187
Non-crop damage	13	147	18	257	25
Total	22	168	72	609	212
2. Assam					
Crop damage	32	26	4	27	9
Non-crop damage	8	3	—	6	3
Total	40	29	4	33	12
3. Bihar					
Crop damage	—	19	95	12	95
Non-crop damage	58	1	84	—	111
Total	58	20	179	12	206
4. Gujarat					
Crop damage	22	17	6	24	22
Non crop damage	46	129	6	30	37
Total	68	146	12	54	59
5. Haryana					
Crop damage	20	—	43	56	30
Non-crop damage	10	—	10	15	8
Total	30	—	53	71	38
6. Orissa					
Crop damage	40	—	11	8	—
Non-crop damage	77	5	34	12	—
Total	117	5	45	20	—
7. Punjab					
Crop damage	4	—	20	1	36
Non-crop damage	1	—	4	—	14
Total	5	—	24	1	50

8. Rajasthan

Crop damage	—	24	22	59	3
Non-crop damage	—	77	30	16	17
Total	—	101	52	75	20

9. Tamil Nadu

Crop damage	—	5	—	47	—
Non-crop damage	—	74	—	105	5
Total	—	79	—	152	5

10. Uttar Pradesh

Crop damage	190	52	382	75	186
Non-crop damage	176	1	179	22	61
Total	366	53	561	97	247

11. West Bengal

Crop damage	33	—	207	40	17
Non-crop damage	45	—	62	—	4
Total	78	—	269	40	21

12. Others

Crop damage	16	6	67	20	10
Non-crop damage	30	7	117	18	9
Total	46	13	184	38	19

All India

Crop damage	366	170	911	721	595
Non-crop damage	464	444	544	481	294
Total	830	614	1455	1202	889

Note : Derived from data published by Central Water Power Commission. Value of damage at current prices.

TABLE 3
Land-use Pattern in India, 1973-74 to 1977-78

(Million hectares)

Heading	1973-74	1974-75	1975-76	1976-77	1977-78 provisional
I. Geographical Area :	—	—	328.78	—	—
II. Irrigated area for land utilization (statistics 1 to 5)	304.10	304.15	304.34	304.78	304.90
1. Forests	65.73	65.87	66.69	67.16	67.11
2. Not available for cultivation (a+b)	41.22	40.77	39.47	39.68	39.06
(a) Land put for non- agricultural uses	16.80	17.14	17.35	17.65	17.63
(b) Barren and unculturable land	24.42	23.63	22.12	22.13	21.43
3. Other uncultivated excluding fallow land (a+b+c)	33.99	33.66	33.97	33.66	33.26
(a) Permanent Pastures & Other grazing lands	12.78	12.85	12.62	12.53	12.36
(b) Land under miscellaneous tree crops & groves not included in net area sown	4.14	4.15	3.98	3.98	3.98
(c) culturable waste	17.07	16.66	17.37	17.15	16.92
4. Fallow lands (a+b)	20.10	25.47	21.99	24.10	22.86
(a) Fallow land other than current fallows	8.81	9.26	9.53	9.70	9.84
(b) Current fallows	11.29	16.21	12.46	14.40	13.02
5. Net area sown (6-7)	143.06	138.38	142.22	140.18	142.61
6. Total cropped area	169.87	164.19	170.99	167.28	172.32
7. Area sown more than once	26.81	25.81	28.77	27.10	29.70
III. Net Irrigated Area	32.55	33.71	34.49	35.15	36.67
IV. Gross Irrigated area	40.28	41.74	43.19	43.53	45.91

Note : Data for the year 1975-76 released earlier have undergone partial revision owing to receipt of further information from some states.

Source : *Agricultural Situation in India.*

TABLE 4
Agricultural Production in India, 1977-78 to 1979-80
 (in million units)

Group/commodity	Unit	1977-78	1978-79	1979-80*
(A) Foodgrains	Tonnes	126.41	131.90	108.85
(a) Cereals	„	114.43	119.72	100.48
Rice	„	52.67	53.77	42.19
Wheat	„	31.75	35.51	31.56
Jowar	„	12.06	11.44	11.32
Maize	„	5.97	6.20	5.58
Bajra	„	4.73	5.57	4.03
Other cereals	„	7.25	7.23	5.80
(b) Pulses of	„	11.97	12.18	8.37
which : gram	„	5.41	5.74	3.28
(B) Non-foodgrains				
(a) Oilseeds**	„	9.10	9.35	8.08
(5 Major of which :				
Groundnuts	„	6.09	6.21	5.77
Rapseed & Mustard	„	1.65	1.86	1.43
(b) Sugarcane (in terms of Gur)	„	17.96	15.73	13.33
(c) Cotton (Lint)	Bales @	7.24	7.96	7.70
(d) Jute	Bales +	5.36	6.47	6.12
(e) Mesta	Bales +	1.79	1.86	1.91
(f) Potato	Tonnes	8.14	10.13	8.31

* Final Estimates

** Includes Five Major oil seeds viz. Groundnuts, rapseeds & Mustard, sesamum, linseed & Castor seed.

@ Bale = 170 kg, + Bale=180 kg.

Source : *Economic Survey*, 1980-81.

TABLE 5
Yield Per Hectares of Major Crops

Group/commodity	1975-76	1976-77	1977-78	1978-79	1980-81
(A) Foodgrains	944	894	991	1022	878
(a) Cereal	1041	985	1100	1136	984
Rice	1235	1088	1308	1328	1082
Wheat	1410	1387	1480	1568	1437
Jowar	591	667	739	709	688
Bajra	496	544	426	489	380
Maize	1203	1060	1051	1076	970
(b) Pulses of which gram	533 707	494 680	509 678	515 744	385 480
(B) Non-Foodgrains					
(a) Oil seeds* (5 Major of which :	651	528	585	588	532
Groundnut	935	747	866	835	797
Rapeseed & Mustard	580	496	460	525	412
(b) Sugarcane (Gur)	5218	5529	5712	5096	5000
(c) Cotton (lint.)	138	144	156	167	162
(d) Jute	1367	1307	1210	1317	1308
(e) Mesta	805	894	884	882	892
(f) Potato	11,738	11,572	12,228	12,555	11,984

* Includes groundnuts, rapeseed & mustard, sesamum, linseed & castorseed.

Source : *Economic Survey*, 1980-81.

TABLE 7
Contribution of Agriculture to National Income
(At Current Prices) (Rs. crores)

Industry	1975-76	1976-77	1977-78	1978-79*
1. Agriculture	25,868	26,692	30,359	31,023
2. Forestry & Logging	722	830	935	1,122
3. Fishing	526	599	623	765
4. Mining & Quarrying	806	885	928	954
Total Primary Industries	27,922	29,006	32,845	33,864
Total Net National Product at Factor Cost	61,899	67,120	75,058	80,354

* Provisional

Source : *R.B.I., Report on Currency & Finance Vol. II, Statistical Tables*, 1979-80.

TABLE 6
Progress of Selected Physical Agricultural Development Programmes

Programme	unit	1970-71	1971-72	1972-73	1973-74	1974-75	1975-76	1976-77	1977-78	1978-79	1979-80	1980-81	Target
1	2	3	4	5	6	7	8	9	10	11	12	13	
High yield varieties Programme :													
Paddy	Million hectares	5.59	7.41	8.11	10.10	11.20	12.40	13.30	15.60	16.90	13.60	20.20	
Wheat	"	6.48	7.86	10.10	11.10	11.20	13.50	14.50	15.50	16.10	13.50	17.80	
Maize	"	0.46	0.44	0.61	0.90	1.10	1.10	1.10	1.20	2.10	2.10	2.10	
Jowar	"	0.80	0.69	0.87	1.10	1.30	2.00	2.40	3.10	3.10	3.10	4.30	
Bajra	"	2.05	1.77	2.50	3.10	2.50	2.90	2.30	2.60	2.90	3.10	3.70	
Total HYP	"	15.38	18.17	22.09	26.10	27.30	31.90	33.60	38.10	41.10	35.20	48.00	
Gross Cropped Area	"	165.79	165.19	162.15	169.87	164.19	170.99	167.28	172.31	173.30	171.00	173.10	
Irrigated Area	"	38.01	39.37	40.82	42.18	43.65	45.30	46.91	48.46	50.60	52.64	55.60	
(Cumulative utilization)	"	17.31	17.77	18.22	18.68	19.35	20.10	20.71	21.16	22.05	22.64	24.06	
Through Major & Medium	"												
Minor*	"	20.70	21.60	22.60	23.50	24.30	25.20	26.20	27.30	28.60	30.10	31.60	
Soil conservation (Addl. "	"												
Area) (a)	"	1.33	1.49	2.17	17.10	18.10	18.90	19.60	20.30	22.60	23.40	24.19	
Consumption of Chemical	"												
Fertilizers :	"												
Nitrogenous	Million tonnes	1.48	1.80	1.84	1.83	1.77	2.15	2.45	2.91	3.42	3.50	4.00	
Phosphatic	"	0.54	0.56	0.58	0.65	0.47	0.47	0.65	0.87	1.11	1.15	1.30	
Potassic	"	0.24	0.30	0.35	0.36	0.34	0.28	0.33	0.51	0.59	0.61	0.70	
Total NPK	"	2.26	2.66	2.77	2.84	2.58	2.90	3.43	4.29	5.12	5.26	6.00	

* Figures for minor Irrigation indicate the net benefit after following seepage.

(a) Cumulative level at the end of year has been given 1973-74 onwards.

a.a. Anticipated achievement.

TABLE 8

State-wise Average size of Operational Holdings for 1971-72
and 1976-77 as per Agricultural census

State	1971-72	1976-77
	(In hectares)	
<i>Group I : Land Records States</i>		
Andhra Pradesh	2.51	2.34
Assam	1.41	1.37
Bihar	1.5	1.1
Gujarat	4.11	3.71
Karnataka	3.20	3.98
Haryana	3.77	3.58
Madhya Pradesh	4.28	3.60
Maharashtra	5.46	4.65
Tamil Nadu	1.45	1.25
Uttar Pradesh	1.16	1.05
Total Group I	2.49	2.18
<i>Group II : Non-Land Records States</i>		
Kerala	0.57	0.49
Orissa	1.89	1.60
Meghalaya	1.70	1.50
West Bengal	1.20	0.99
Total Group II	1.26	1.04
Himachal Pradesh	1.53	1.65
Tripura	1.02	1.20
Manipur	1.15	1.2
Nagaland	5.40	7.61
Punjab	2.89	2.71
Jammu & Kashmir	0.94	0.94
Sikkim	—	2.56
Mizoram	—	1.49
All-India Total	2.28	2.20

TABLE 9

Irrigation facility in relation to cultivated area : 1950-51
to 1976-77

	Net area irrigated by Source (Percent).					Net irrigated area (millions hectres)	Net irrigated area as per cent of net sown area.
	Govern- ment canals	Private canals	Tanks	Wells	others		
1950-51	34.3	5.5	17.3	28.7	14.2	20.9	17.6
1955-56	35.3	6.0	19.4	29.6	9.7	22.8	17.6
1960-61	37.2	4.9	18.5	29.6	9.8	24.7	18.5
1965-66	37.4	4.2	16.2	32.8	9.4	26.3	19.3
1970-71	38.5	2.8	13.2	38.2	7.3	31.1	22.1
1971-72	37.5	2.8	13.0	38.4	8.3	31.6	22.7
1972-73	38.1	2.7	11.4	40.7	7.1	31.8	23.1
1973-74	37.3	2.7	12.0	40.7	7.3	32.5	22.8
1974-75	37.4	2.6	10.6	42.3	7.1	33.7	24.4
1975-76	37.4	2.5	11.6	41.6	6.9	34.5	24.3
1976-77						34.6	24.6

TABLE 10

Irrigation resources : 1950-51 to 1979-80

Irrigation Potential : 1950-51 to 1979-80

(In gross million hectares)

Period	Major and medium	Minor irrigation			Total irrigation
		Ground	Surface	Total	
Pre-Plan (1950-51)	9.70	6.50	6.40	12.90	22.60
End of 1st Plan (1955-56)	12.19	7.63	6.43	14.06	26.25
End of 2nd Plan (1960-61)	14.33	8.30	6.45	14.75	29.08
End of 3rd Plan (1965-66)	16.56	10.52	6.48	17.00	33.56
End of Annual Plans (1968-69)	18.10	12.50	6.50	19.00	37.10
End of 4th Plan (1973-74)	20.70	16.50	7.00	23.50	44.20
End of 5th Plan (1977-78)	24.77	19.80	7.50	27.30	52.07
Additional Target (1978-79)	1.35	1.05	0.25	1.30	2.65
Additional Target (1979-80)	1.10	1.25	0.25	1.50	2.60
Ultimate feasible	58.50	40.00	15.00	55.00	113.50

TABLE 11
Development of Groundwater Structures : 1950-51
to 1979-80

(In '000 Nos)

Period	Dugwells	Private Shallow tubewells	Public cheap tubewells	Electric Pumpsets	Diesel Pumpsets
Pre-Plan (1950-51)	3,860	3	2.4	21	66
End of 2nd Plan (1960-61)	4,540	20	8.9	200	230
End of Annual Plans (1968-69)	6,110	360	14.7	1,090	720
End of IVth Plan (1973-74)	6,700	1,140	22.0	2,430	1,750
End of Vth Plan (1977-78)	7,425	1,700	30.0	3,300	2,500
During (1978-79)	210	200	3.4	300	200
Target (1979-80)	280	250	3.9	400	200
Ultimate feasible	12,000	4,000	60.0	12,000	5,000

TABLE 11
Statewise Ultimate Irrigation Potential and Potential Created

Upto 1979-80
(000 hectares)

State/Union Territories	Ultimate irrigation Potential	Total Agriculture area (1976-77)	Potential created upto 1979-80		Potential created as per cent of Total Ultimate Agriculture irrigation area (a) Potential		
			Major	Minor			
Andhra Pradesh	9,200	11,863	2,932	1,985	4,917	41.4	53.4
Assam	2,670	3,311	103	288	391	11.8	14.6
Bihar	12,400	11,325	2,452	2,355	4,787	42.3	38.6
Gujarat	4,750	10,189	1,047	1,431	2,478	24.3	52.2
Haryana	4,550	5,282	1,769	1,257	3,026	57.3	66.5
Himachal Pradesh	335	929	—	97	97	10.4	29.0
Jammu & Kashmir	800	936	105	313	418	44.7	52.3
Karnataka	4,600	9,864	1,100	1,015	2,115	21.4	46.0
Kerala	2,100	2,934	479	310	789	26.9	37.6
Madhya Pradesh	10,200	20,856	1,403	1,550	2,953	14.2	29.0
Maharashtra	7,300	19,787	1,283	1,632	2,915	14.7	39.9
Manipur	240	208	8	26	34	16.3	14.2

Meghalaya	120	204	—	25	25	12.3	20.8
Nagaland	90	115	—	42	42	36.5	46.7
Orissa	5,900	7,209	1,429	665	2,094	29.0	35.5
Punjab	6,550	6,285	2,307	2,913	5,220	83.1	79.7
Rajasthan	5,150	16,898	1,547	1,812	3,359	19.9	65.2
Sikkim	42	...	—	9	9	...	21.4
Tamil Nadu	3,900	7,147	1,188	1,887	3,075	43.0	78.8
Tripura	215	386	—	38	38	9.8	17.7
Uttar Pradesh	25,700	23,152	5,013	8,840	14,853	64.2	57.8
West Bengal	6,110	7,632	1,573	1,430	3,003	39.3	49.7
Union Territories	480	600	10	100	110	18.3	22.9
All-India	1,13,402	1,67,112	26,748	30,000	56,748	340	500

Notes: (a) Worked out on the basis of irrigation potential created up to the end of 1979-80 and agriculture area for 1976-77.

(...) — Not available

(—) Nil or Negligible.

TABLE 12
Irrigated Area under Different Crops

Group/ Commodity	1971-72	1972-73	1973-74	1974-75	1975-76	(Million hectares)	
						1976-77	1977-78
Rice	14.08 (37.3)	14.42 (39.3)	14.67 (38.3)	14.67 (38.7)	15.05 (38.1)	14.76 (38.3)	16.17 (43.1)
Jowar	0.73 (4.4)	0.54 (3.5)	0.68 (4.1)	0.75 (4.6)	0.81 (4.0)	0.78 (5.0)	0.67 (4.1)
Bajra	0.44 (3.7)	0.56 (4.7)	0.59 (4.2)	0.64 (5.7)	0.64 (4.4)	0.52 (5.6)	0.52 (4.7)
Maize	0.80 (14.1)	0.39 (18.7)	0.88 (14.6)	1.22 (20.8)	0.95 (15.8)	1.03 (17.2)	0.90 (15.8)
Wheat	10.40 (64.3)	10.77 (55.3)	10.76 (57.9)	11.08 (61.5)	12.69 (62.0)	13.67 (65.3)	13.83 (64.4)
Barley	1.20 (48.9)	1.20 (49.0)	1.36 (51.3)	1.65 (57.2)	1.52 (54.2)	1.26 (56.8)	1.08 (54.0)
Total cereals	28.11 (28.0)	29.10 (29.5)	29.30 (28.4)	30.48 (30.8)	32.16 (31.0)	32.47 (32.0)	33.63 (32.3)
Total Pulses	1.97 (8.9)	1.76 (8.4)	1.87 (8.0)	1.82 (8.3)	1.95 (8.0)	1.78 (7.7)	1.70 (7.2)
Total Food-grains	30.48 (24.5)	30.76 (25.8)	31.17 (24.6)	32.31 (26.7)	34.11 (26.6)	34.25 (27.5)	35.33 (27.7)
Oilseeds	1.22 (7.1)	1.07 (6.8)	1.36 (8.2)	1.47 (8.7)	1.17 (7.1)	1.09 (6.7)	1.53 (9.16)
Cotton	1.70 (21.8)	1.72 (22.4)	1.73 (22.8)	1.78 (23.5)	1.70 (23.1)	1.75 (25.4)	1.98 (25.2)
Sugarcane	1.73 (72.4)	1.80 (76.7)	2.19 (79.6)	2.31 (79.8)	2.23 (80.7)	2.33 (8.12)	2.60 (82.5)

Note: (1) Figures in parenthesis represent the percentage irrigated area to total area under crop

(2) Irrigated area under oil-seeds denote the area under ground nut, rapeseed & mustard, linseed, castorseed, sesamum sunflower & niger-seed.

Source: Economic Survey, 1980-81.

TABLE 13

Major on-going Projects of the Sixth Plan started before 1.4.1976 which are likely to be completed during the Sixth Plan

Sl. No.	Name of the state/project	Sl. No.	Name of the State/Project
ANDHRA PRADESH		KARNATAKA	
1.	Nagarjunsagar	26.	Bhadza
2.	Sriram Sagar Stage I	27.	Tungabhadra
3.	Godavari Barrage		Tungabhadra H.L.C.
4.	Vamsadhasa Stage I		KERALA
5.	Tungabhadra H.L.C. Stage II	28.	Chittarpuzha
6.	Somasilla Stage I	29.	Kuttiadi
	ASSAM	30.	Pamba
7.	Dhamsiri	31.	Pazahassi
	BIHAR		MADHYA PRADESH
8.	Gandhak	32.	Mahanadi Reservoir Phase I
9.	Kosi Barrage & Eastern Canal	33.	Tawa
10.	Rajpur Canal	34.	Upper Wainganga
11.	Sone H.L.C.	35.	Chambal (Stage I & Stage II)
12.	Barner Reservoir		MAHARASHTRA
	GUJARAT	36.	Jayakawadi Stage I
13.	Mahi Stage I	37.	Krishna
14.	Mahi Stage II (Kadhana)	38.	Bhima
	Mahi Bajaj Sagar	39.	Upper Tapi Stage I
15.	Damanganga	40.	Manjra
16.	Panam	41.	Mula
17.	Ukai	42.	Waghur
18.	Sabarmati	43.	Khaadakwasla
	HARYANA	44.	Upper Godavari
19.	Beas Unit I		MANIPUR
20.	Beas Unit II	45.	Loktak Lift Irrigation
21.	Gurgaon Canal		ORISSA
22.	Jawaharlal Nehru Lift Scheme	46.	Mahanadi Delta
23.	Loharu Lift Irrigation	47.	Anandpur Barrage
24.	Sewani Lift Irrigation	48.	Rengali Dam
25.	W.J.C. Remodelling		(Dam's share under Irrigation)

Sl. No.	Name of the State/Project	Sl. No.	Name of the State/Project
	PUNJAB	56.	Kosi Irrigation
	Beas Unit I	57.	East Baigul Reservoir
	Beas Unit II	58.	Increasing capacity of
49.	Diversion weir of Shahnahar Canal		Narainpur pump Canal
	RAJASTHAN	59.	Parallel Lower Ganga Canal
	Beas Unit I	60.	Sone pump Canal
	Beas Unit II	51.	Increasing capacity of Deokali
	Chambal (Stage I and Stage II)		Pump Canal
	Gurgaon Canal		WEST BENGAL
50.	Jakham	62.	Kangsabati Reservoir
51.	Mahi Bajaj Sagar	63.	Teesta Barrage 1st sub-stage of
52.	Rajasthan Canal Stage I		Phase I
	TAMIL NADU	64.	D.V.C. Ext. & Improvements
53.	Parambikulam Aliyar		GOA, DAMAN, & DIU
54.	Modernisation of Periyar	65.	Salhuli
	Vaigai system		Damanganga
	UTTAR PRADESH		DADRA & NAGAR HAVELI
	Gandak Canal		Damanganga
55.	Sarda Sahayak		

TABLE 14
State-wise Installed Capacity and Power Generation 1979-80

State/Union Territories/ Board/Corporation	Installed capacity		Power generation		Efficiency of the power system dur- ing 1979-80 as measured by power generation per year per kw of capa- city (kwh)
	MW	Percent	Million Kwh	per- cent	
States					
Andhra Pradesh	1,879	6.9	6,807	6.4	3,623
Assam	142	0.5	511	0.5	3,599
Bihar	845	3.1	2,615	2.5	3,095
Gujarat	2,251	8.2	8,868	8.4	3,940
Haryana	362	1.3	531	0.5	1,467
Himachal Pradesh	105	0.4	338	0.3	3,219
Jammu and Kashmir	199	0.7	689	0.7	3,462
Karnataka	1,320	4.8	5,411	5.0	4,099
Kerala	1,012	3.7	5,118	4.9	5,057
Madhya Pradesh	1,379	5.0	6,087	5.8	4,414
Maharashtra	3,824	14.0	17,491	16.6	4,574
Orissa	880	3.2	2,484	2.4	2,823
Punjab	536	2.0	1,628	1.5	3,037
Rajasthan	491	1.8	2,245	2.1	4,572
Tamil Nadu	2,719	9.9	9,915	9.4	3,647
Uttar Pradesh	3,329	12.2	11,227	10.6	3,372
West Bengal	1,556	5.7	5,224	5.0	3,357
Union Territories	854	3.1	3,364	3.2	3,939
Bhakra Management Board	1,205	4.4	6,663	6.3	5,529
Damodar Valley Corporation	1,421	5.2	4,618	4.4	3,250
Beas Construction Board	900	3.3	3,333	3.2	3,703
Others (a)	149	0.6	358	0.3	2,403
All-India	27,358	100.0	1,05,525	100.0	3,857

Notes: (a) Includes Meghalaya, Nagaland, Sikkim and Tripura

TABLE 15
State-wise utilisation of hydro-power potential

State	Hydro Power potential		Percentage share of hydel in total installed capacity (1977-78)
	Million kw at 60 percent	Percent	
Andhra Pradesh	2.477	6.0	45
Assam	11.598	28.2	—
Bihar	0.610	1.5	10
Gujarat	0.677	1.6	18
Himachal Pradesh	1.868	4.5	98
Jammu & Kashmir	3.591	8.7	78
Karnataka	3.373	8.3	100
Kerala	1.540	3.7	100
Madhya Pradesh	4.582	11.2	17
Maharashtra	1.910	4.6	42
Manipur	0.865	2.1	6
Orissa	2.062	5.0	72
Punjab	1.361	3.3	72
Rajasthan	0.149	0.4	75
Tamil Nadu	0.707	1.7	70
Uttar Pradesh	3.764	9.1	38
West Bengal	0.022	0.1	3
All-India	41.156	100.0	42

(—) = Nil

TABLE 16
Villages electrified and pumpsets/tube-wells energised
1950-51 to 1980-81

	Villages electrified		Number of irrigation pumpsets/tube-wells energised
	Number	As percent of total number of villages	
1950-51	3,061	0.5	21,000
1955-56	7,294	1.4	56,056
1960-61	21,750	3.8	1,98,904
1965-66	45,144	8.0	5,12,756
1968-69	73,732	13.0	10,88,804
1973-74	1,66,729	28.9	24,26,133
1974-75	1,72,169	29.9	26,11,982
1975-76	1,85,806	32.3	27,92,960
1976-77	2,02,869	35.2	30,41,305
1977-78	2,16,898	37.7	33,09,246
1978-79	2,33,042	40.5	35,99,328
1979-80	2,50,108	43.4	39,49,056
1980-81*	2,56,307	44.5	40,53,443

Note : *Data as on August 31, 1980.

TABLE 17
Production & Imports of Fertilizers
 (in '000 tonnes of nutrients)

Year	Nitrogenous Fertilizers			Phosphatic Fertilizers			Potassic Fertilizers* Inputs
	Production	Inputs	Total	Production	Inputs	Total	
1973-74	1060	659	1719	323	215	536	370
1974-75	1185	884	2069	327	281	608	437
1975-76	1535	950	2485	320	337	657	269
1976-77	1900	750	2650	480	23	503	278
1977-78	2000	758	2758	670	164	834	599
1978-79	2170	1228	3398	770	242	1013	517
1979-80(P)	2226	1295	3521	757	237	994	473

*There is no local Production.

P=Provisional

TABLE 18
Production of Breeder, Foundation and Certified Seed

(In Qn'tls)

Crop	Breeder seed		Foundation Seed		Certified Seed	
	1979-80 (Estimated)	1980-81 (Estimated)	1979-80 (Estimated)	1980-81 (Estimated)	1979-80 (Estimated)	1980-81 (Estimated)
Maize	2	2	1,523	3,215	23,085	43,445
Jowar	22	2	2,316	6,217	13,627	70,100
Bajra	1	0.1	399	1,181	8,850	37,492
Paddy	34	48	3,023	4,755	56,982	140,700
Wheat	340	124	23,704	60,000	283,479	435,400
Oilseeds	13	215	53	296	3,607	15,530
Pulses	191	502	1,396	5,742	6,486	20,004
Fodder	20	64	163	642	3,429	4,630
Fibre	35	10	257	482	23,584	15,500
Vegetables	16	46	555	1,615	11,606	20,368
Potato	3,276	4,044	11,165	25,000	6,239	8,000
Total	4,650	5,057	44,554	109,145	440,974	811,169

TABLE 19
Live-Stock in India 1972

	(000)
A. Cattle :	1972
(i) Male over 3 years :	
(a) used for breeding only	386
(b) used for breeding and work both	1,988
(c) used for work only	70,574
(d) Others	1,511
Total	74,459
(ii) Females over 3 years :	
(a) In milk	22,034
(b) Dry	26,330
(c) Working	2,704
(d) Not calved even once	5,045
(e) Others	915
Total	56,398
(iii) Young stock	47,484
Total Cattle :	178,341
B. Buffaloes :	
(i) males over 3 years :	
(a) used for breeding only	222
(b) used for breeding and work both	603
(c) used for work only	7,009
(d) Others	232
Total	8,066
(ii) Females over 3 years :	
(a) In milk	15,070
(b) Dry	11,300
(c) Not calved even once	2,242
(d) Working	369
(e) Others	262
Total	29,243
(iii) Youngstock	20,117
Total	57,426

<i>C. Sheep</i>	39,993
<i>D. Goats</i>	67,518
<i>E. Horses & Ponies</i>	942
<i>F. Pigs</i>	6,896
<i>G. Other Livestock</i>	1,113
Total Livestock	3,53,338
Poultry	1,38,544
Tractors	148
Fishing Crafts (mechanised boats)	12
Fish Crafts (non-mechanised boats)	217
Fishing gears	3,882

Source : *Agricultural Situation in India*, December, 1980.

TABLE 20
Selected Features of Fisheries in Important States—1979

	Andhra Pradesh	Gujarat	Kerala	Tamil Nadu	Maharashtra	Karnataka	Orissa	West Bengal	Goa
1. Marine fish production (tonnes — 1979)	91,426	1,91,312	3,30,509	2,35,008	2,93,326	1,26,384	51,808	10,744	25,388
2. Inland fish production (tonnes 1978)	1,00,009	10,000	24,000	1,75,000	19,000	75,000	25,000	2,60,000	1,000
3. Continental shelf area (sq. Kms.)	39,109	1,20,000	38,673	34,820	89,096	24,999	20,160	17,094	9,809
4. Fishermen population (Number)	1,36,893 (47,000)	82,242 (11,732)	3,33,822 (74,241)	2,14,868 (56,586)	1,03,535 (20,698)	51,636 (11,732)	33,630 (8,828)	2,311 (606)	—
5. Fishing villages (Number)	419	133	249	349	348	151	156	182	—
6. Fishermen's coop. societies (Number)	662	57	1,026	450	445	129	160	610	—
7. Indigenous fishing crafts (number)	19,772	3,179	20,667	29,661	7,894	6,357	2,786	108	—
8. Mechanised boats (Number)	586	3,164	2,322	2,371	4,718	2,127	117	55	387
9. Brackish water area (million hectares)	0.5665	0.4189	0.3399	0.1457	0.1214	0.1092	0.4128	0.8175	—
10. Fresh water area (million hectares)	0.3772	0.3310	0.0948	0.4188	0.2634	0.7490	0.4096	0.5665	—
Sixth Plan Targets									
1 Outlay (Rs. lakhs)	1,400	2,000	2,000	2,400	1,207	1,303	1,000	2,700	400
2 Production (1984-85) (000 tonnes-)									
(i) Inland	250	55	40	210	40	70	63	524	10
(ii) Marine	138	345	498	300	420	230	54	41	60
(iii) Total	388	400	538	510	460	300	117	565	70

(x) Figures in bracket indicate the number of active fishermen.

TABLE 21

State-wise Distribution of Main Marine Fish Varieties — 1979 (tonnes)

	Andhra Pradesh	Gujarat	Goa	Maha rashtra	Kerala	Karna-taka	Orissa	West Bengal	Tamil Nadu	Total (including others)
1. Oil Sardines (Tarti)	—	—	3,030	16	1,16,834	33,080	—	—	1,011	1,53,971
2. Bombay ducks (Bombil)	717	63,984	9	59,667	1	5	449	1,211	1	1,26,044
3. Penaeid prawns	8,697	8,606	1,594	45,638	29,522	4,654	2,983	410	10,222	1,13,665
4. Sciaenids (Dhoma, Ghol, etc.)	8,825	28,230	1,492	21,366	5,237	2,348	5,351	915	18,948	93,018
5. Mackerel (Bangada)	2,621	35	4,391	1,455	18,585	40,084	306	—	3,521	71,514
6. Ribbon fish (Bagga, Vakati, etc.)	6,337	4,491	548	10,983	25,718	1,193	616	291	21,040	71,349
7. Lesser Sardines (Pedve)	6,180	—	2,471	927	15,914	4,753	2,687	—	33,289	68,351
8. Non-penaeid prawns	3,117	3,347	—	56,208	75	6	34	161	897	63,917
9. Silver Bellies	3,585	—	881	724	3,597	1,565	1,108	96	42,886	55,266
10. Elasmobranchs (Mori)	6,994	4,926	1,280	12,516	6,954	2,531	4,331	244	12,393	52,843
11. Catfishes (Shingada)	3,799	5,320	846	10,433	11,128	9,920	1,308	140	5,617	48,817
12. Pomfrets	2,069	9,319	—	14,941	1,737	250	10,109	923	877	40,427
13. Perches	3,095	973	203	3,225	20,239	181	151	225	5,919	35,657
14. Seer fish (Surmai)	5,547	2,682	1,101	4,027	6,275	1,645	2,444	331	5,228	29,547
Total Marine fish (including others)	91,426	1,91,312	25,388	2,93,326	3,30,509	1,26,384	51,808	10,744	2,35,008	13,88,380

Sixth Plan Target (1984-85)

(i) Marine	1,38,300	3,45,000	60,000	4,20,000	4,98,000	2,30,000	54,000	41,005	3,00,000	21,21,250
(ii) Inland	2,50,000	55,000	10,000	40,000	40,000	65,000	63,000	5,24,000	2,10,000	16,11,610
(iii) Total	3,88,000	4,00,000	70,000	4,60,000	5,38,000	3,00,000	1,17,000	5,65,000	5,10,000	37,32,860

TABLE 22

India's Marine Fish Production (Main Varieties)
('000 tonnes)

	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979
(1) Oil Sardines	174	227	209	128	144	127	159	169	150	168	154
(2) Bombay ducks	76	78	72	52	64	61	100	87	85	125	126
(3) Penaeid Prawns	72	90	72	78	137	115	142	115	96	129	114
(4) Sciaenids	35	42	37	40	88	79	114	88	100	96	93
(5) Mackerel	92	139	205	109	79	37	46	65	62	85	72
(6) Ribbon Fish	32	27	45	36	53	65	57	65	42	78	71
(7) Lesser Sardines	52	55	61	45	109	84	112	100	66	53	68
(8) Non Penaeid Prawns	34	32	77	85	67	55	79	77	74	51	64
(9) Silver bellies	44	49	33	32	48	51	40	42	35	42	55
(10) Elasmobranchs	35	44	84	46	45	66	65	55	62	62	53
(11) Catfishes	27	51	49	42	53	76	69	44	54	39	49
(12) Pomfrets	24	18	21	19	22	22	25	38	35	41	40
(13) Perches	13	14	13	15	22	37	35	18	32	49	36
(14) Seer fish	12	13	18	21	20	20	19	20	21	21	30
Total (including others)	914	1086	1161	980	1220	1217	1422	1353	1260	1404	1388

TABLE 23

Progress of Cooperative Credit Movement in India

(Rs. in crores)

Type of Institutions	1976-77	1977-78	1978-79	1979-80
<i>A. State Cooperative Banks</i>				
(i) Number	26	26	26	
(ii) Share capital	—	77.29	79.05	
(iii) Owned funds	184	214	239	
(iv) Deposits	835	1,004	1,206	
(v) Borrowing from RBI	375	470	360	
Of which for short-term agricultural purposes	229	289	252	
(vi) Working capital	1,525	1,822	2,000	
(vii) Loans issued	1,899	2,023	2,237	
(viii) Loans outstanding	1,089	1,338	1,396	
(ix) Loans overdue	58	96	124	
<i>B. Central Cooperative Banks</i>				
(i) Number	344	338	338	
(ii) Share capital	„	295.54	314.10	
(iii) Owned funds	423	484	533	
(iv) Deposits	1,154	1,377	1,654	
(v) Borrowings from RBI/ Apex. Banks	699	784	101	
(vi) Working Capital	2,514	2,954	3,301	
(vii) Loans issued	1,988	2,116	2,407	
(viii) Loans outstanding	1,796	2,115	2,309	
(ix) Loans overdue	596	754	828	
<i>C. State/Central Land Development Bank</i>				
(i) (a) Number (Central)	19	19	19	19
(b) „ (Primary)	892	892	892	892
(ii) Owned funds	164	213	234	—
(iii) Debentures issued	—	228.23	231.79	267.13
(iv) Debentures outstanding	1,591	1,691	1,765	—
(v) Working capital	1,918	2,082	2,188	—
(vi) Loans issued	249	239	241	308.21

(vii) Loans outstanding	1,211	1,305	1,393
(viii) Loans overdue	94	127	182
(ix) Loans to individuals by CDDBs/PLDBS			
(a) Issued	278	238	239
(b) Outstandings	1,193	1,276	1,330
(c) Overdues	115	135	195

D. Primary Agricultural Credit Societies

(i) No. of societies (000)	626	116	102
(ii) Percent of village covered	—	91.0	—
(iii) Membership (000)	44,832	47,860	51,560
(iv) Percentage of rural pop. covered	—	43.0	43.0
(v) Share capital	—	420.69	449.75
(vi) Owned funds	449	555	593
(vii) Deposits	142	165	204
(viii) Borrowings	1,420	1,616	1,721
(ix) Working capital	—	2,712.42	2,918.68
(x) Total Loans Issued	1,211	1,273	1,395
(xi) Total Loans for Agr. purposes	1,511	1,207	1,349
<i>of which</i>			
medium-term	436	149	162
(xii) Loans outstanding	1,602	1,798	1,982
(xiii) Loans overdue	683	809	895
(xiv) Loans overdue as % of loans outstanding	42.6	34.9	45.2

Source : *Report on Trends and Progress of Banking in India, 1979-80.*

TABLE 24
Net Availability of Cereals & Pulses

Year	Popu- lation (mill.)	Net Pro- duc- tion (m. tonnes)	Cereals		Pulses		Per capita Net Availability per day		
			Net Im- ports (m. tonnes)	Net Avail- ability (m. tonnes)	Avail- ability (m. tonnes)		Cereals	Pulses	Total (in grams)
1975	600.8	78.50	7.39	80.42	8.76	366.7	34.9	406.6	
1976	613.3	94.50	6.44	90.67	11.40	402.5	50.8	452.8	
1977	625.8	87.33	0.41	88.92	9.94	391.2	43.5	434.7	
1978	638.4	100.13	(-)1.00	99.14	10.32	426.6	44.3	470.9	
1970	651.0	104.76	(-)0.94	103.46	10.66	435.4	44.9	480.3	
1980*	663.6	87.92	(-)0.42	93.17	7.32	383.6	30.1	413.7	

*Provisional

Source : *Economic Survey, 1980-81.*

Aiyar, A. K. Y. N.

Agarwal, A. N.
Agarwal, G. D.

Ahmed, M. B.
Altekar, A. S.
Anton
Anstey, V.
Aroora, R. C.,

Bansil, P. C.

Banerjee, F.
Banerjee, P. K.
Benett, H. H.
Bhattacharya S. N.

Bhatia, B. M.

Bosemp Ester
Buchanan, H. O. and
Brady, N. D.
Burns, W.

Brayne, F. L.

Chandy, M.
Chatterjee, S. K.
Chinchanker and
Namjoshi
Chauhan, D. S.

Chaudhari, M.
Chaudhari, P.

Chaudhari, S. P.
Coldwel, M. G. &
Others
Dagli, V. (Ed.)
Dakshinamurthi, C.
etc.

SELECTED READINGS

- (i) Principles of Husbandry in India, 1957.
- (ii) Village Improvement and Agricultural Extensions, 1954, Agriculture in India, 1978.
- (i) Agrarian Reforms.
- (ii) Re-organisation of Agricultural Credit, 1952.
- Problems of Rural Uplift in India
- History of Village Communities in India.
- National Forest Policy of India, 1952.
- Economic Development of India, 1959.
- (i) Development of Agriculture and Allied Sectors, 1978.
- (ii) Industrial and Rural Development, 1978.
- (iii) Experiences of Industries in Rural Development, 1978.
- (i) Agricultural Planning for 700 millions, 1971.
- (ii) India's Food Resources.
- (iii) Agricultural Problems of India, 1978.
- Co-operation in India, 1962.
- Indian Agricultural Economy, 1977.
- Elements of Soil Conservation.
- Community Development : An Analysis of Programme in India, 1970.
- (i) Famines in India (1860-1965), 1967.
- (ii) India's Food Problem and Policy since Independence, 1970.
- (iii) Poverty, Agriculture and Economic Growth, 1977.
- Conditions of Agricultural Growth, 1965.
- The Nature and Properties of Soil, 1964.
- (i) Technological Possibilities of Agricultural Development in India, 1944.
- (i) Remaking of Village India.
- (ii) Schemes of Rural Reconstruction, 1931.
- Fishes, 1970.
- Starving Millions, 1943.
- Co-operation and Dynamics of Change, 1977.
- (i) Agricultural Economics, 1948.
- (ii) Studies in Utilisation of Agricultural Land, 1966.
- Gramdan Movement, 1957.
- (i) Readings in Indian Agricultural Development, 1973.
- (i) Indian Economy, Poverty and Development, 1978.
- Land and People, 1966.
- Report of the Community Development Evaluation Mission in India, 1959.
- Foundations of Indian Agriculture, 1969.
- Water Resources of India and their utilization in India 1973.

- Dantwala, M. L. and Shah, C. H.** Evolution of Land Reform, Vol. I & II, 1971.
- Dayal, R.** Community Development Programme in India 1969.
- Datta, B. N.** Dialects of Land Economics in India, 1952.
- Darling, M. L.** Punjab Peasantry in Prosperity and Debt, 1950.
- Das Gupta, A. D.** Agriculture and Economic Development in India, 1973.
- Desai, Mutalik** Strategy of Food and Agriculture in India, 1969.
- Demello, F.** Problems of Rural Reconstruction.
- Dey, S. K.** Community Development, Vols. I & II, 1963.
- Dhamma, O. P.** Extension of Rural Welfare, 1973.
- Dhar and Lydall** The Role of Small Enterprises in Indian Economic Development 1961.
- Digby, M.** Cooperative Farming, 1954.
- Dohannue, R. L.** Our Soils and Their Management.
- Dutt, C. P. and Pugh, B. M.** General Principles and Practices of Crop Production in India, 1940.
- Dutt, A. K.** Soils, Manures and Fertilizers, 1963.
- Dwivedi, R. C.** New Strategy of Agricultural Development in India, 1972.
- Driver, P. N.** Problems of Zamindari and Land Tenure Reconstruction.
- Easminger, D.** Rural India in Transition, 1972.
- Farmer, B. N.** Agricultural Colonisation in India Since Independence, 1974.
- Gadgil, D. R.** Economic Effects of Irrigation, 1948.
- Gadkary, D. A.** A Manual of Soil Conservation, 1956.
- Gangrade, K. D.** Community Organisation in India 1971.
- Gandhi, C.P.** Tax Burden on Indian Agriculture, 1966.
- Ghatak, S.** Rural Money Markets in India, 1976.
- Ghosh, A.** Cooperative Farming : Problems and Possibilities, 1959.
- Ghosh, B. B.** Problems of Agricultural Credit in India, 1944.
- Ghosal, S. A.** Agricultural Financing in India, 1974.
- Govil, K. L.** Agricultural Marketing in India, 1956.
- Govil, R. K.** Agricultural Planning and Social Justice in India.
- Gowda, Malle** Whither Rural India, 1959.
- Goyal, S. C.** Some Aspects of Cooperative Farming in India, 1967.
- Goyal S. K.** Cooperative Farming in India, 1966.
- Gupta, A. P.** Marketing of Agricultural Produce in India, 1974.
- Gupta, S. C.** India's Agrarian Structure, 1966.
- Harris, D. G.** Irrigation in India, 1930.
- Hart, H. C.** Administrative Aspects of River Valley Development, 1961.
- Herrick, T.** Rural Credit.
- Hoswell, M. R.** Economics of Development in Village India, 1967.
- Howard, A.** (i) Forest Policy of India, 1952.
- (ii) Development of Indian Agriculture.
- Hough, E.** The Cooperative Movement in India, 1966.
- Hussain, F.** Agricultural Marketing in India.
- Jain, S. C.** (i) Problems and Policies in Indian Agriculture, 1963.
- (ii) Agricultural Planning in India, 1964.
- (iii) Indian Rural Economics, 1965.
- (iv) Agricultural Development in India, 1967.
- (v) Village Panchayats and Community Development in India, 1967.
- (vi) Principles and Practice of Agricultural Marketing and Policies 1970.

- Jha, B. V.
 Jasdanwala, J. V.
 John, F. V.
- Joshi, P. C.
 Kalra, O. P.
 Kathuria, G. and
 Chandrasekharan, K.
 Kavooosi, J. C. and
 Singh, B. N.
 Kellog, C. E.
- Khosla, A. N.
 Khusro, A. M.
- Kulkarni, G. B.
 Khusro, A. M.
 Khusro A. M. and
 Agarwal, A. N.
 Kotvesky, G.
 Krishna, Ram
- Krishnamachari, V. T.
 Krishna, D.
 Kulkarni, D. G.
 Kumar, L. S. S. &
 Others
 Kuriyan, G.
 Lachmann, David,
 Laxminarayan, H. &
 Kanungo, Kissen
 Lele, Uma D.
 Law, B. C. (Ed.)
 Louis, F. H.
 Lal, R.
- Malviya, H. D.
- Mamoria, C. B.
- Mamoria, C. B. &
 Saxena, R. D.
 Mann, H. S.
- Mellor, J. M.
 Minhas, B. S.
 Mirchandani, G. G. (Ed.)
 Khan, A. R.
 Mirchandani, T. J.
 Sen, Sudhir
 Mukerjee, Karuna
 Mukerjee, B.
 Myrdal, G.
- Nanavati, M. B. &
 Anjaria, J. J.
- Agricultural Price Stabilization, 1971.
 Marketing Efficiency in Indian Agriculture, 1965.
 Some Aspects of Structure of Indian Agricultural
 Economy (1947-48 to 1961-62), 1968.
 Land Reforms in India : Trends and Prospects, 1976.
 Agricultural Policy in India, 1973
- Elements of Agricultural Finance, 1973.
- History of Rural Development in Modern India, 1967.
 (i) Soils That Support Us, 1956.
 (ii) Soil Conservation and Soil Survey in India, 1961.
 Appraisal of Water Resources of India, 1951.
 (i) Economics of Land Reform and Farm Size in
 India, 1973.
 (ii) Readings in Agricultural Development.
 Cooperative Marketing in India, Vols. I, II & III.
 Economics of Land Reform and Farm Size in India.
- Problems of Co-operative Farming in India, 1961.
 Agrarian Reforms in India, 1954
 Grassroots of Agricultural and Community Develop-
 ment Programme in India, 1966.
 Community Development in India, 1961.
 New Agricultural Strategy, 1974.
 People and Irriculture, 1970
 Agriculture in India, Vols. I, II and III.
- India : A General Survey, 1970.
 Agrarian Reforms, 1974.
 Glimpses of Cooperative Farming in India, 1967.
- Foodgraining Marketing in India, 1971.
 Mountains and Rivers of India, 1970.
 Agricultural Price Policy in India, 1961.
 Community Development : Principles, Practice and
 Problems.
 (i) Land Reforms in India, 1955.
 (ii) Village Panchayats in India, 1958.
 Geography of India, Vol. I : Agricultural Geography,
 1975.
 Cooperation in India, 1976.
- Analysis of Some Problems of Community Develop-
 ment in India, 1967.
 The Economics of Agricultural Development, 1966.
 Planning and the Poverty, 1976.
 Aspects of Agriculture in India, 1973.
 Green Manuring, 1953.
 Crop Rotation in India, 1956.
 Reaping the Green Revolutions, 1975.
 Land Reforms, 1952.
 Community Development in India, 1961.
 The Asian Drama : A Enquiry into Poverty of
 Nations Vol. I, II and III, 1968.
- Indian Rural Problem, 1975.

Nanavati, M. B.
Nayadu, N. S. &
Narimhan
Palme Dutt, Rajni
Pande, V. P.
Patel, S. F.

Patel, G. D.
Patel, A. D.
Patel, B. A.
Patwardhan, V. N.
Powell, Baden

Ragnekar, D. K.
Raheja, P. C., Natrajan,
T., & R. K. Tandon
Raheja, P. C.
Rajgopalan, &
Singh, C. M.
Raj, K. N.

Rajkrishna, Jain, L. C..
& Gopal Krishna
Rajamani, A. N.
Ramamurthy, B.
Ramaswami, T. N.
Rama Rao, M. S. V.
Randhawa, M. S. &
Others
Randhawa, M. S.

Rao, K. L.

Rao, R. V.

Rao, L. R.
Rao, C. H.
Ranga, N. G.
Rao, V. K. R. V.
Ray, A. C.
Ray Chaudhari, S. P.

Sagreiya, V. P.
Samant, S. V.
Sau, Ranjeet

Schiller Otto

Sen, S. R.

Sen, B.
Shenoy, P. V.
Sidhu, B. S.
Singh Baljit,

Land Tenures in India, 1946

Economics of Indian Agriculture, Vols. I & II, 1955.
India Today, 1959.
Village Community Projects in India, 1967.
Agricultural Labourers in Modern India and Pakistan, 1952.
Land System of Union Territories in India, 1970.
Indian Agricultural Economics, 1937.
Agricultural Price Problem in India, 1959.
Dietary Allowances for India, 1960.
(i) Land System of British India, 1892.
(ii) Land Revenue in British India, 1892.
(iii) Village Communities in India.
Agricultural Finance in India, 1952.

A Text Book of Crop Production.
Soil Productivity and Crop Growth, 1957.
Adoption of Agricultural Innovation.

Report of the Committee on Taxation of Agricultural Wealth and Income, 1973.

Co-operative Farming Some Reflections, 1956.
Conditions Necessary for Agricultural Growth, 1970.
Agricultural Labour : How They Live and Work, 1954.
Stabilization of Agricultural Prices, 1947
Soil Conservation in India, 1964.

Farmers in India, Vol. I, II, III and IV.
(i) Agriculture and Animal Husbandry in India, 1958.
(ii) Green Revolution, 1974.
(i) India's Water Resources, 1975.
(ii) Irrigation, 1972.

Cottage Industries : Their Role in National Economy 1966.

Rural Co-operatives in India, 1974.
Taxation of Agricultural Lands in Andhra, 1966.
Peasant and Cooperative Farming, 1956.
Agricultural Labour in India, 1948.
Co-operative Farming in India, 1978.
Land Resources of India Vol. I : Indian Soils Their Classification, Occurrence and Properties, 1963.
Forests and Forestry, 1967.
Village Panchayats in India, 1956.
Indian Economic Growth Constraints and Prospects, 1973.

Co-operative Farming and Individual Farming on Co-operative Holdings, 1957.

Strategy for Agricultural Development and other Essays on Economic Policy and Planning, 1966.

Green Revolution in India : A Perspective, 1974.
Agricultural Development in India, 1974.
Land Reforms, Welfare and Economic Growth, 1976.
(i) Whither Agriculture in India, 1945.
(ii) Next Step in village India, 1961.

- Singh, Tarlok** (i) Poverty and Social Change, 1970.
(ii) India's Development Experience, 1974.
- Singh, N.P.** Wasteland in India and Its Reclamation.
- Singh, K. Suresh** The Indian Famine, 1967 : A Study in Crisis and Change 1974.
- Singh, Mukhtar** Rural Reconstruction in India.
- Singh, Charan** (i) Whither Co-operative Farming ? 1959.
(ii) Joint Farming X-Rayed, 1959.
(iii) India's Poverty and its Solution, 1964.
(iv) India's Economic Policy : The Gandhian Blueprint, 1977.
- Singh, Harbans** Domestic Animals, 1966.
- Singh, H. & Moore, E.N.** Livestock and Poultry Production, 1968.
- Sovani N.V.** Economics of Multipurpose River Dams.
- Spate, O' H.K.** India and Pakistan, 1969.
- Srivastava, H.S.** History of Famines in India, 1969.
- Stebbing, E.** Forest of India, Vols. I to IV (1922-26), 1962.
- Sen, Sachin** Tenure of Agricultural Land.
- Sen, Bhowani** Evolution of Agrarian Reform's in India, 1962.
- Sundram, J.D.** Rural Development, 1969.
- Sukhatme, P.V.** Feeding India's Growing Millions, 1965.
- Tardy, M.L.** Systems of Agricultural Credit, 1930.
- Taylor, C.C.** A Critical Analysis of India C.D. Programme, 1956.
- Tewari R.D.** Indian Agriculture, 1946.
- Thirumalal, S.** Postwar Agricultural Problems and Policies, 1954.
- Thorner, D.** The Agrarian Prospects of India, 1956.
- Thorner, A and Thorner, D.** Land and Labour in India, 1962.
- Thomas, P.** The Problem of Agricultural Indebtedness.
- Wadhwa, Charan N (Ed.)** Some Problems of India's Economic Policy, 1977.
- Wadhwa, D.F.** Agrarian Legislation in India, Vol. 1, 1973.
- Wilson M.L.** Comments on Community Development Programme in India, 1956.

REPORTS

Congress Agrarian Reforms Committee Report, 1946

F.A.O.

- Land Policy in Near East, 1967.
- Inter Relationship between Agrarian Reforms and Agricultural Development, 1953.

Govt. of India

- Report on Cooperation in India, 1915.
- Report on the Cooperative Marketing of Agricultural Produce 1943.
- Report on the Foodgrains Policy Committee, 1966.
- Report of the Prices Sub-Committee of the Policy Committee, on Agriculture, Forests and Fisheries, 1947.
- Report of the Foodgrains Enquiry Committee, 1957.
- Report of the Famine Enquiry Commission, 1946.
- Report of the Co-operative Planning Committee, 1946.
- Major Water and Power Projects in India.
- Report on the Hydro Electric Survey in India, 1921.

- Report on the Indian Delegation to China on Agrarian Co-operatives, 1957.
- Report of the Indian Delegation to China on Agricultural Planning and Techniques, 1957.
- Report of the Working Group on Cooperative Farming, 1959.
- Report on the Problems of Cattle Insurance under Indian Conditions, 1950.
- Report of the Bengal Land Revenue Commission, 1946.
- Community Development Programmes in India, 1958.
- Evaluation Report on the Working of Community Projects.
- Report on the Team for the Study of Community Projects, 1957.
- Report of the Agricultural Prices Commission,
- Report of the Committee on Rural Development 1958.
- Report of the Committee on Cooperative Credit, 1960

I.C.A.R.

- Manures and Manuring, Farm Bulletin No. 7, 1957.
- Soils in India, 1963.
- Handbook of Agriculture 1970.
- Handbook of Animal Husbandry, 1969.

Ministry of Agriculture & Irrigation

- Agricultural legislation in India, Vol. I to IX.
- Studies in Economics of Farm Management Reports for West Bengal, U.P., Madras, Punjab, Bombay, M.P., Andhra Pradesh, Orissa.
- Papers on Farm Planning and Management.
- Report on Farm Planning and Management.
- Economy Survey of Indian Agriculture, 1974.
- Indian Agriculture in Brief, 1977.
- Indian Agricultural Atlas, 1978.
- Report of the Agricultural Administrative Committee 1958.
- Furd Foundation Team's Report on India's Food Crisis and Steps to Meet it, 1959.
- Report of the Fertilizers Distribution Enquiry, Committee, 1960.
- Report of the Royal Commission on Agriculture, 1928.
- Memorandum on the Development of Agriculture and Animal Husbandry in India, 1944.
- Report on the Marketing of Cattle.
- Report on the Reorganisation of Goshalas and Pinjarapoles, 1948.
- Report of the Committee on the Utilization of Food and Agricultural Wastes, 1962.
- Annual Reports of the Department of Agriculture, from 1971-72 to 1977-78.
- Annual Reports of the Department of Irrigation from 1971-72 to 1977-78.
- Annual Report of the Department of Food, from 1971-72 to 1977-78.
- Annual Report of the Department of Rural Development, 1974-75 to 1977-78.
- Report of the Committee on Panchayati Raj Institutions, 1978.

Ministry of Finance

- Economic Survey, for various years.
- Report of the Study Group on Wages, Incomes and Prices, 1978.

Ministry of Civil Supplies & Co-operation

- Annual Report of the Department of Co-operation, 1971-72 to 1977-78
- Sakhari Samaj, 1963.
- Report of the Committee of Direction on Co-operative Farming 1965.

- Co-operation in India, 1965.
- Community Development and Panchayati Raj in India, 1952-72.
- Evaluation of the C.D. Programme in India.
- Report of the Working Group on Panchayats and Co-operatives.
- Report of the Committee on Takavi loans and Co-operative Credit.

Ministry of Irrigation and Power

- Administration and Financing of Irrigation Works in India, 1965.
- Report of the Committee to suggest Ways and Means of Improving Returns from Irrigation Projects.
- New Projects for Irrigation and Power in India, 1954.
- Planning for Power Development in India, 1955.
- Major Water and Power Projects, 1957.

Ministry of Labour

- Agricultural Labour in India ; Report of the First Enquiry, 1952.
- Agricultural Labour in India : Report of the Second Enquiry, 1960.
- Report on Intensive Survey of Agricultural Labour Employment, Wages and Levels of Living 7 Vol., 1955.

National Planning Committee

- Report on Crop Planning and Production, 1948.
- Report on Rural Marketing and Finance, 1948.
- Report on Soil Conservation and Afforestation, 1948.
- Report on Animal Husbandry and Fishes, 1948.
- Report on Cottage and Small Scale Industries, 1948.
- Report on Land Policy, Agricultural Labour and Insurance, 1948.

National Co-operative Development Corporation

- Report of the Committee on Co-operative Administration, 1963.
- Report of the Committee on Co-operative Credit, 1963.
- Annual Reports from 1971-72 to 1974-75.

N.C.A.E.R.

- Crop Pattern in M.P.
- Crop Pattern in Punjab.
- Factors Affecting Fertilizer Consumption Problems and Policies, 1964.
- Criteria for Fixation of Water Rates and Selection of Irrigation Projects, 1959.
- Pesticides in Indian Agriculture, 1967.
- Impact of Mechanisation in Agriculture on Employment, 1973.

National Commission on Agriculture—Interim Reports

- Multiplication and Distribution of Quality Seed Pertaining to High Yielding Varieties and Hybrids of Cereals, 1971.
- Fertilizer Distribution, 1971.
- Some Aspects of Agricultural Research Extension and Training, 1971.
- Credit Survey for Small and Marginal Farmers and Agricultural Labourers, 1972.
- Milk Production through Small and Marginal Farmers and Agricultural Labourers, 1972.
- Establishment of Agro-meteorological Division in Agricultural Universities, 1972.
- House sites for Landless Agricultural Labourers, 1972.
- Production Forestry—Man-Made Forests, 1972.
- Soil Survey and Soil Map of India, 1972.

Selected Readings

- Organisational Aspects of All India Co-ordinated Research Projects, 1973.
Modernising Irrigation Systems and Integrated Development of Command Areas, 1973.
Whole Village Development Programme, 1973.
Organisation and Functions of the Commodity Development Councils and Directorates, 1973.
Reorientation of Programmes of Small Farmers and Marginal Farmers and Agricultural Labourer's Development Agencies, 1973.
Poultry, Sheep and Pig Production through Small and Marginal Farmers and Agricultural Labourers for Supplementing Their Income, 1973.
Sericulture, 1973.
Social Forestry, 1973.
Forest Research and Education, 1974.
Desert Development, 1974.
Certain Important Aspects of Selected Export Oriented Agriculture Commodities, 1974.
Agricultural Price Policy, 1975.
Certain Important Aspects of Marketing and Prices of Cotton, Jute, Groundnut and Tobacco, 1975.
Report of the National Commission on Agriculture :
Vol. I—Review and Progress, 1976.
Vol. II—Policy and Strategy, 1976.
Vol. III—Demand and Supply, 1976.
Vol. IV—Climate and Agriculture, 1976.
Vol. V—Resources Development 1976,
Vol. VI—Crop Production, Sericulture, Agriculture, 1976.
Vol. VII—Animal Husbandry, 1976.
Vol. VIII—Fisheries, 1976.
Vol. IX—Forestry, 1976.
Vol. X—Inputs, 1976.
Vol. XI—Agrarian Reforms, 1976.
Abridged Report, 1976.

Planning Commission

- First Five Year Plan, 1951.
Second Five Year Plan, 1956.
Third Five Year Plan, 1961.
Fourth Five Year Plan, 1969.
Draft Fifth Five Year Plan, 1974.
Mid-Appraisal Plans for various years.
Fifth Five Year Plan, 19...
Draft Five Year Plan, 1978-83.
Study on Wastelands and their Reclamation, 1963.
Studies in Co-operative Farming, 1956.
Report on Seed Multiplication Schemes, 1961.
Report on the Study of Utilization of Co-operative Loans, 1965.
Report of the Committee of the Panel of Land Reforms, 1961.
Progress of Land Reforms, 1963.
Report of the Central Land Reforms Committee, 1971.
Report of the Task Force on Agricultural Relations, 1973.

Reserve Bank of India

- Report on Currency and Banking for various years and for 1974-75 and 1977-78.
Role of R.B.I. in the Scheme of Agricultural Credit, 1943.
Review of the Co-operative Movement in India for 1939-46, 1946-48 :

1948-50 ; 1950-52 ; 1952-54 ; 1954-56 ; 1956-58 ; 1958-60 ; 1964-66 ; 1968-70 ; 1970-72 ; 1972-74 and 1974-76.

Report of the All India Credit Survey Committee, Vol I, Pts. I and II, Summary.

Report of the Committee on Direction : All India Rural credit, follow up Survey 1956-57 (1960).

Report of the Rural Credit Review Committee, 1969.

Report of the Co-operative Planning Committee, 1946.

Report of the Committee on Co-operative Credit.

All India Debt and Investments Survey, 1960-61 and 1970-71.

U.N.O.

Land Reforms : Defects in Agrarian Structure as Obstacles to Economic Development, 1951.

Progress in Land Reforms, 1966.

PERIODICALS YEAR BOOKS

Year Books

Times of India Year Book, 1978.

India : Reference Annual, 1976 and 1977-78.

Dailies Weeklies

Economic Times, Bombay.

Economic and Political Weekly, Bombay.

Commerce, Bombay.

Eastern Economist, New Delhi.

Fortnightly

Yojana, New Delhi.

Co-operator, N.C.U.C., New Delhi.

Monthlies

Indian Farming, New Delhi.

Khadi Gramodhyog, Bombay.

Reserve Bank of India Bulletin, Bombay.

Rural India, Bombay.

Agricultural Situation in India, New Delhi.

Quarterlies

Co-operative Perspective, Poona.

Indian Co-operative Review, New Delhi.

Bhagirath, New Delhi

Indian Journal of Agricultural Economics, Bombay

Community Development and Panchayati Raj Digest.

Multi-Agency Approach in Agricultural Finance (Kamath) Committee Report, 1978.

Report of the Expert Group on Agricultural Credit Schemes of Commercial Banks (Desai Committee), 1978.

Regional Rural Banks Report of the Review Committee (Dantwala Committee).